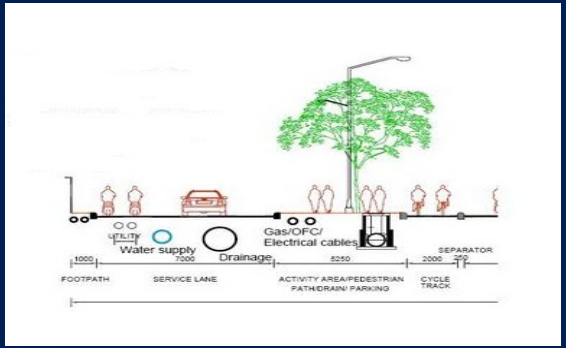
MARYLAND DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION

Utility Manual



Issued: January 20, 2021

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

Larry Hogan
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Boyd K. Rutherford
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Gregory Slater
Secretary
Tim Smith, P.E.
Administrator

January 6, 2021

Mr. Gregory Murrill
Division Administrator
Federal Highway Administration
10 South Howard Street, Suite 2405
Baltimore MD 21201

Dear Mr. Murrill:

Pursuant to the Federal Highway Administration (FHWA) DelMar Division's review of the Maryland Department of Transportation State Highway Administration (MDOT SHA) Utility Policy dated August 11, 2011, the MDOT SHA is seeking your approval for the MDOT SHA's Utility Manual.

The MDOT SHA Utility Manual has been rewritten in concert with our many offices including, but limited to; Office of Planning & Preliminary Engineering, Office of Structures, Office of Highway Design, Office of Environmental Design, Office of Traffic & Safety, Office of Real Estate, all 7 District Offices, and Office of Counsel. Additionally, we have worked with and have had input from various utilities such as BGE, Verizon, Comcast, Washington Gas, and Maryland Gas Operators Advisory Committee (GOAC).

Mr. Nelson Smith, MDOT SHA's Statewide Utility Engineer has worked with Ms. Lourdes Castaneda, FHWA DelMar Division Senior Area Engineer in addressing FHWA's review and comments from not only FHWA's DelMar Division, but others from FHWA such as FHWA's Resource Center.

Please sign and return the original copy of this letter indicating your concurrence for approval or return a copy of the Utility Manual with pertinent comments. If you have any additional questions or concerns, please contact Mr. Nelson Smith, MDOT SHA Office of Construction Statewide Utility Engineer, at 443-572-5267 or via email at nsmith@mdot.maryland.gov. Mr. Smith will be happy to assist you.

Sincerely,

Tim Smith

Tim Smith, P.E.
Administrator

Enclosures

cc: Mr. Jitesh Parikh, Project Delivery/Environmental Team Leader, DelMar Division, FHWA
Ms. Lourdes Castaneda, Senior Area Engineer Team Leader, DelMar Division, FHWA
Mr. Stephen Bucy, Director, Office of Construction, MDOT SHA
Mr. Nelson Smith, Statewide Utility Engineer, Office of Construction, MDOT SHA

Concurrence:

GREGORY KEITH MURRILL Digitally signed by GREGORY KEITH MURRILL Date: 2021.01.20 13:49:18 -05'00'

1/20/21

Gregory Murrill
Division Administrator, FHWA

Date

PREFACE

The Maryland Department of Transportation (MDOT) is comprised of five business units and one Authority. They are: The Secretary's Office, State Highway Administration, Maryland Transit Administration, Motor Vehicle Administration, Maryland Port Administration, Maryland Aviation Administration and the Maryland Transportation Authority. Along with BWI, Martin State Airport, Light Rail, Metro Subway, MARC Train and the Helen Delich Bentley Port of Baltimore, MDOT is charged with operating and maintaining over 5,000 miles of highways along with bridges, traffic operations systems, rest areas, and other facilities in order to provide safe and efficient transportation of the public traveling in and through Maryland. The reconstruction and rehabilitation of existing facilities and the construction of new facilities are significant parts of MDOT's program to ultimately "deliver safe, sustainable, intelligent, and exceptional transportation solutions in order to connect our customers to life's opportunities."

The MDOT recognizes the benefits gained by sharing the transportation right-of-way by electric, communications, gas, water, sewer, and other utilities. However, sharing the transportation right-of-way also means that needed construction and maintenance work on the MDOT's transportation system will ultimately conflict with these utilities.

"You can't regulate common sense" ~ Nelson Paul Smith, Sr. (1924-1990) It is virtually impossible to address every possible scenario in which the MDOT and the Utilities will interface. And as such, it is not the intention of this manual to replace creative problem solving or sound engineering judgment in this interaction. Instead, the concept promoted by the MDOT and this manual, known as Coordination, Cooperation, and Communication (CCC), is the most effective tool to facilitate productive working relationships. This manual will address two critical areas in which the MDOT and the Utilities interact - accommodation and coordination.

Proactive utility accommodation within MDOT rights-of-way is the first, best practice to minimize the potential impacts with future MDOT projects; avoid costly right-of-way restoration; reduce intrusive utility maintenance operations; and eliminate unnecessary disruptions to the traveling public. All of these factors contribute to the overall cost to construct and maintain both the transportation and utility infrastructures. It is in the best interest of the public to minimize these costly situations as the public ultimately bear these costs whether as a taxpayer or utility ratepayer.

The utility coordination task is often critical to the success of a project. If not mitigated in an effective and timely manner, conflicts often result in costly delays and claims that affect the MDOT, utility companies, and the public. Proactive utility coordination early in the planning and scoping of a project will reduce the effort needed later in the design and construction of a project. History has shown that doing early coordination and continuing coordination through the life of a project, is the most effective method to identify and resolve issues as early as possible; facilitate timely utility relocations; and ultimately minimize the overall project costs to the MDOT, utility companies, and the public.

The policies and processes in this manual for accommodating utility facilities and coordinating with utility companies are based on these CCC principles. In the longer term beyond just immediate project needs, this also has a significant positive effect on MDOT's relationships with utility companies.

This Utility Manual contains numerous hyperlinks to other documents, websites, and to other sections within this Utility Manual to assist the user in fully understanding the information contained herein. As such, this Utility Manual is distributed in an electronic format only. If the user opts to print this Utility Manual, the user will lose its hyperlink functionality.

UTILITY MANUAL
DECEMBER 18, 2020
Maryland State Highway Administration

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CHAPTER 1

INTRODUCTION

1.01 ABBREVIATIONS, TERMS, AND DEFINITIONS

In this Utility Manual, the following abbreviations, terms, and definitions have the meanings indicated:

1.01.01 Abbreviations:

See definitions for more information for abbreviations with an *

AASHTO	*American Association of State Highway and Transportation Officials*
ADA	*Americans with Disabilities Act*
ADT	*Average Daily Traffic* *
ANSI	*American National Standards Institute*
API	*American Petroleum Institute*
APWA	*American Public Works Association*
ASCE	*American Society of Civil Engineers*
ASTM	*American Society of Testing and Materials*
AWS	*American Welding Society*
AWWA	*American Water Works Association*
BPW	*Maryland Board of Public Works*
CATV	*Community Antenna TeleVision*
CFR	*Code of Federal Regulations*
CHART	*Coordinated Highways Action Response Team*
COMAR	*Code of Maryland Regulations*
CTP	*Consolidated Transportation Program* *
DNR	*Maryland Department of Natural Resources*
FAPG	*Federal-Aid Program Guide*
FCC	*Federal Communication Commission*
FHWA	*Federal Highway Administration*
HLR	*Highway Location Reference* *
ITS	*Intelligent Transportation System* *
MdMUTCD	*Maryland Manual on Uniform Traffic Control Devices*
MDOT	*Maryland Department of Transportation* *
MDOT MAA	*Maryland Aviation Administration*
MDOT MDTA	*Maryland Transportation Authority*
MDOT MTA	*Maryland Transit Administration*
MDOT MPA	*Maryland Port Administration*
MDOT SHA	*Maryland State Highway Administration*
Miss Utility	*Maryland's One Call System*
MOSH	*Maryland Occupational Safety and Health*
MOT	*Maintenance of Traffic*
NESC	*National Electrical Safety Code*
NFPA	*National Fire Protection Association*
OED	*MDOT SHA Office of Environmental Design*
OHD	*MDOT SHA Office of Highway Development*
OOC	*MDOT SHA Office of Construction*
OOS	*MDOT SHA Office of Structures*

OOTS	*MDOT SHA Office of Traffic & Safety*
ORE	*MDOT SHA Office of Real Estate*
OPA	*Other Principle Arterial* *
OSHA	*Occupational Safety and Health Administration*
PSC	*Maryland Public Service Commission*
PS&E	*Plans, Specifications, & Estimate or; Plans, Special Provisions, & Estimate* *
ROW or R/W	*Right-of-Way* *
SIEC	*State Infrastructure Executive Committee* *
SUE	*Subsurface Utility Engineering* *
TCP	*Traffic Control Plan* *
TBU	*Transportation Business Unit* *
TSO	*The Secretary of Transportation's Office*
U.S.C.	*United States Code*

1.01.02 Terms and Definitions:

Access Control: The condition whereby the rights of owners or occupants of land abutting the highway right-of-way, or other persons, to access, light, air, or view in connection with a highway is controlled by the MDOT SHA by law.

a. **Full Control of Access:** Means that preference is given to through traffic by prohibiting at-grade intersections or direct private driveway connections and providing access connections only at selected public cross roads by providing interchange connections.

b. **Partial Control of Access:** Means that preference is given to through traffic by limiting the number of public roads crossing at grade and generally restricting private driveway connections.

Abandoned or Abandonment: In the past, this term was used to denote utility facilities that were deactivated or taken out-of-service. As the connotation of this term implied that there was no further responsibility for the facility, this term is no longer used. The Utility is still responsible for any utility facility that is deactivated or taken out-of-service unless otherwise agreed to, in writing, by the MDOT SHA and the Utility.

Accommodation: The installation of utility facilities along or across right-of-way with the intent that they will occupy and jointly use the right-of-way.

Active Project: An active project is any project that is on MDOT SHA's Ad Schedule (Financial or Production) or under construction; and will be considered active until the date of its final acceptance.

Ad Schedule: The Financial Ad Schedule and the Production Ad Schedule are financial and administrative management tools used to arrange, control and optimize design work and project delivery.

Adjustment: The required modification to an existing utility facility to eliminate a conflict with a proposed highway/structure element on an active project where the utility facility will generally be retained in the same location.

Application: The documentation and process by which an applicant submits a request to the MDOT SHA to obtain a permit.

Approved Flagger: A person providing temporary traffic control who is certified under a program approved by the MDOT SHA.

Appurtenances: Accessories, appendages, equipment, features, parts, etc. that are part of a facility or system, whether primary or secondary to its function.

Arterial Highway: A general term denoting a highway primarily for through traffic, usually on a continuous route.

As-Built Plans: Certified Record Drawings by the Utility Owner/Operator which depict the actual location of a utility facility after construction.

Authorized Public Utility: A Utility Company verified by the MDOT SHA that it: is authorized to install, operate and maintain facilities in Maryland; is capable of maintaining and relocating its facilities as necessitated by MDOT SHA operations and projects; and is able to respond to an emergency in a timely manner as may be required.

Auxiliary Lane: The portion of the roadway adjoining the traveled way marked to separate access ramps, speed changes, turning, storage for turning, weaving, truck climbing, or other purposes supplementary to through traffic movement.

Average Daily Traffic (ADT): The average 24-hour traffic volume for a period of time, usually a year.

Award: The formal acceptance by the MDOT SHA of a bid for highway construction work.

Backfill: Material used to replace or the act of replacing material removed during construction; also, may denote material placed or the act of placing material adjacent to structures.

Bedding: Composition and shaping of soil or other suitable material to support a pipe, conduit, casing, or utility tunnel.

Betterment: the act or process of making or upgrading of a utility facility such that value, capacity, performance, or convenience of maintenance to the utility system is better to that which existed prior to construction of the transportation project.

Bond: A surety bond posted to ensure proper and complete construction and/or repair of a facility and the affected rights-of-way pursuant to a permit.

Boring: The operation by which holes are made or enlarged. Typically, with regards to trenchless technology, bores are carved progressively ahead of the leading edge of the advancing pipe as soil is conveyed back through the pipe.

Cap: A rigid structural element surmounting a pipe or other facility to provide protection and distribute loads.

Carrier: A pipe directly enclosing a transmitted substance such as liquid, gas, etc., or an electric or communication cable, wire, or line.

Casing: A larger protective pipe enclosing a carrier pipe, conduit, or duct and designed to resist potential impacts and carry imposed loads.

Cathodic Protection: is a technique used to control the corrosion of a metal surface by making it the cathode of an electrochemical cell.

Clear Zone: The total roadside border area starting at the edge of the travel way, available for safe use by errant vehicles. This area may consist of the shoulder, a recoverable slope, a non-recoverable slope, and/or a clear run-out area. The desired width is dependent upon the traffic volumes and speeds, and on the roadside geometry.

Coating: Protective material applied to or wrapped around a pipe, ductline, conduit, cable, etc.

Common Law: Also known as "case law," or "case precedent," common law provides a contextual background for many legal concepts. Common Law is the body of law developed in England primarily from judicial decisions based on custom and precedent, unwritten in statute or code, and constituting the basis of the English legal system and of the system in the United States.

Communication Facility: The aggregate of equipment such as telephones, facsimile equipment, conduits, cables, fiber optic cables, and other electronic equipment used for various modes of transmission, such as light, digital data, audio signals, image and video signals.

Conduit: An enclosed tubular casing, singularly or multiple, for the protection of wires, cables, or lines, usually jacketed and often extended from utility access hole to utility access hole.

Conflict: A conflict occurs when a utility facility requires relocation or adjustment to avoid damage or disruption or to comply with the regulations and accommodation requirements to accommodate construction, maintenance, operations, or other alterations the MDOT SHA undertakes.

Consolidated Transportation Program (CTP): Maryland's six-year capital budget for transportation projects. The CTP includes capital projects that are generally new, expanded or significantly improved facility or service that may involve planning, environmental studies, design, right-of-way acquisition, construction or the purchase of essential equipment related to the facility or service.

Construction Engineering (CE) Costs: CE Costs are the construction and engineering costs incurred by the MDOT SHA during the construction period for each MDOT SHA project.

Cover (Depth): Vertical distance, from the top of pipe or pipe's protective coating, casing, duct, cable, etc. to some specified surface such as pavement, ditches, or shoulders.

Cradle: A rigid structural element below and supporting a pipe carrier or casing.

Designee: The individual to whom the MDOT SHA delegates certain levels of authority to act on behalf of the MDOT SHA.

Direct Construction Costs: are the line items contained in contract estimate (MDOT SHA's Construction Categories 100 thru 900, or any portion thereof) for the MDOT SHA Project identifying the quantities and unit costs for all work to be performed by MDOT SHA's contractor for that Project.

District: One of the 7 geographical management regions defined by the MDOT SHA. Refer to ENGINEERING DISTRICTS MAP for additional information.

Duct: An enclosed tubular casing for protecting wires, lines, or cables, often flexible or semirigid.

Easement: A right, other than the acquisition of title, acquired to use or control property for a designated purpose.

Emergency: A situation resulting from a sudden unexpected event or incident which presents a clear and imminent danger requiring immediate action to prevent or mitigate loss or damage to life, health, property or essential public services.

Encasement: A structural element surrounding a pipe carrier or casing.

Erosion Control: Practices used to minimize soil loss and the discharge of turbid runoff in accordance with Local, State and Federal regulations.

Escalation Process: MDOT SHA's process using the Utility Issue Resolution Flowchart and the Utility Issue Resolution Contact List to raise an issue, action or concern to successive levels of MDOT and Utility Company management for resolution, particularly when resolution cannot be reached at the project level (Level 1). The Project Team should always strive to make decisions and address items at the lowest level possible.

Exception: Any utility installation, adjustment, and/or relocation that is contrary to this Utility Manual. Refer to Section 2.07 EXCEPTIONS for additional guidance.

Expressway: A divided arterial highway for through traffic with partial access control and, generally, with grade separations at major intersections.

Facility or Facilities: Any part, item, material, or piece of equipment (including any laterals and/or appurtenances) used by the Utility for the transmission and/or distribution of a utility product (e.g. water, sewer, electricity, gas, telecommunications, etc.), or portion thereof that is in place and is part of the Utility System. The term "Facility" or "Facilities" shall include but is not limited to, any and all poles, wires, guys, anchors, buried cable, conduit, pedestals, pipe lines, hydrants, valve boxes, manholes, casings, river gages, and related fixtures.

Final Billing: A detailed summary of the actual costs incurred by the Utility including documentation necessary to verify the amounts expended in connection with the relocation of utility facilities for a transportation project.

Financial Ad Schedule: is a publicly available list of projects with approved funding for the construction phase and dedicated advertisement dates. Projects having advertisement dates within the upcoming 24 months are shown on the Financial Ad Schedule.

Flowable Fill: Controlled Low Strength Material A low strength, slurry-like fill material primarily used in below grade applications such as utility trenches, where low strength and ease of placement are required. It is typically placed using conventional ready-mix concrete trucks.

Freeway: A fully controlled access highway with interchange connections at selected public cross roads.

Frontage Road: A street or road auxiliary to and located on the side of an expressway or freeway for service to abutting property and for control of access.

Governmental Requirements – includes all laws, regulations, agreements and requirements of all governing bodies, agencies, and/or entities, including but not limited to the federal, state or local governmental bodies, agencies and/or entities.

Grounded: Electrically connected to the earth or to some extended conducting body which serves instead of the earth, whether the connection is intentional or accidental.

Grout: fluid mixture of cement and water or of cement, sand, and water and may be modified with fly ash used to fill joints and voids. Also called slurry.

Handhole: A pull box, junction box, or an access opening in an underground system which is used for the purpose of splicing or pulling cables.

Highway Location Reference (HLR): A list of all roads maintained by the MDOT SHA and the Maryland Transportation Authority (MdTA). It also provides the most commonly requested data elements of the state roadway network.

Highway, Street or Road: A general term denoting a public way for the transportation of people, but primarily for vehicular travel, including the entire area within the right-of-way.

Horizontal Clearance: The lateral distance from edge of traveled way to a roadside object or feature.

Horizontal Directional Drilling: A method of drilling where a remotely controlled cutting head is pushed from an entry pit through the soil under the surface. Changes in line and grade can be made as the operation proceeds. The cutting head is tracked electronically from the surface. Conduits, cables, or casings are pulled back through the opening, sometimes following an enlarging reamer. Drilling fluids are usually used for lubrication and to support the opening until the conduit, casing, or cable is pulled into place. Hydraulic cutting heads that remove the soil by washing or jetting are not allowed.

Impact Moling or Missiling: A pneumatically-powered cylinder, attached to an external air supply, which is inserted in a pilot hole at proper depth and grade. The pneumatic hammering action of the head of the tool propels the cylinder through the soil. A wire, cable, casing, or carrier pipe is pulled back through the opening by the attached air supply line. Current equipment limits openings to about 50 mm or 2 inches in compressible soils.

Inspector: The MDOT SHA's authorized representative assigned to make detailed inspection of project or permit performance.

Intelligent Transportation System (ITS): A system used to collect, store, process, distribute, and use data about the movement of vehicles, people, and goods to enhance safety and security, reduce traffic congestion, save energy, and in other ways improve generally the performance of the State's highways. Two subsystems of the ITS are Advanced Traveler Information System (ATIS) and Advanced Transportation Management System (ATMS).

Interchange: A system of interconnecting roadways in conjunction with one or more grade separations that provides for the movement of traffic between two or more roadways or highways on different levels.

Jack & Boring: A method of boring where casing or carrier pipe can be jacked through bores carved progressively ahead of the leading edge of the advancing pipe as soil is moved through the pipe, normally with an auger that has been placed inside the pipe. Limited directional change can be achieved with new advances in equipment.

Jacking: Pushing a pipe horizontally under a roadway by mechanical means with or without boring.

Joint Use: The use of pole-lines, trenches, or other facilities by two or more Utilities.

Maintenance: The work required to keep an existing facility (MDOT SHA or Utility) in good state of repair without adding to its physical makeup or changing its physical capacity.

Manhole: An opening to an underground system which workers or others may enter for the purpose of making installations, inspections, repairs, connections, tests, etc.

Maryland Department of Transportation (MDOT): MDOT is an organization comprised of the Secretary's Office, five Transportation Business Units (TBU) and one Authority. They are: The Secretary's Office, State Highway Administration, Maryland Transit Administration, Motor Vehicle Administration, Maryland Port Administration, Maryland Aviation Administration and the Maryland Transportation Authority.

Maryland Manual on Uniform Traffic Control Devices, Current Edition (MdMUTCD): The MdMUTCD is the combined document of the national set of traffic control device standards and guidance promulgated by Federal Highway Administration (FHWA) rulemaking on December 16, 2009 and Maryland Supplement to the MUTCD.

May: a choice to act or not, or a promise of a possibility. Refer to Law.com Online Dictionary, http://dictionary.law.com/Default.aspx?selected=1229.

Median: The portion of a divided highway separating the traveled ways for traffic in opposite directions.

Mitigation/Restoration: Vegetative restoration of the site to make the impact of the vegetation management activities milder or less severe. Vegetation management activities often involve forest canopy and ecosystem losses and require mitigation on site to the fullest extent possible.

MDOT SHA's Construction Categories – The MDOT SHA identifies the work to be performed under its construction contracts by category. In addition, the same category code system is used for all the line items used in the construction of MDOT SHA Projects. These categories are:

Category 100 – Preliminary
Category 200 – Grading
Category 300 – Drainage
Category 400 – Structures
Category 500 – Paving
Category 600 – Shoulders
Category 700 – Landscaping
Category 800 – Traffic & Utilities
Category 900 – Materials

MDOT SHA Project: includes each project undertaken by the MDOT SHA that may include a Utility Relocation and/or a Utility Betterment.

Must: be commanded or be required. Refer to Merriam-Webster's Online Dictionary https://www.merriam-webster.com/dictionary/must.

Other Principle Arterial (OPA): is a major roadway for through flow of traffic. OPA's include "arterials," "thoroughfares," and "preferential roadways." These roadways connect areas of principal traffic generation and are sometimes subdivided into primary and secondary.

Overfill: The initial 6-inches to 1-foot of backfill above a pipe, ductline, conduits, cables, etc.

Owner: The individual, company, government agency, etc., having ownership and responsibility for a utility facility.

Parties: The MDOT SHA, a Municipal or Local Government Entity, a Utility Company, any other Company, and/or the Contractor may be a party (or parties) where applicable.

Pavement: The combination of sub-base, base course, and surface course placed on a sub-grade to support the traffic load and distribute it to the roadbed.

Permit: The legal document by which the MDOT SHA regulates the use and/or occupancy of the right-of-way for a Utility. The term permit also may include all details, plans, special provisions, etc.

Pipe: A tubular section or hollow cylinder for the conveyance of liquids or gases. It can also be used for structural applications. Cylinders formed from plate in the course of the fabrication of auxiliary equipment are not pipe as defined here.

Pipeline: Any and all pipelines, hydrants, valve boxes, manholes, conduits, casings, and/or related fixtures authorized in the permit.

Plan Development Process: The MDOT SHA's current process of project development from Planning through Construction.

Pole-line: Any and all poles, wires, guys, anchors, and/or related fixtures authorized in the permit.

Preliminary Engineering: Engineering activities required during the Plan Development Process of an active project that provides for all the necessary plans, documents, and any other supporting information necessary to determine utility impacts and the appropriate coordination.

Pressure: Relative internal pressure in a pipe.

Prior Rights: is an industry term and refers to the superiority (order) of property interests determined between multiple parties. (i.e. whether a utility facility occupancy predates MDOT SHA's existing or proposed right-of-way.)

Private Lines: Privately owned facilities which convey or transmit the commodities outlined in the definition of Utility of this section, but devoted exclusively to private use.

Production Ad Schedule: is used to arrange, control and optimize design work and project delivery to meet anticipated funding resources for construction projects programmed without a dedicated advertisement date.

Project Manager: The MDOT SHA's representative, typically in a design office, in responsible charge of a project. The Project Manager makes the day to day engineering decisions and is responsible for steering, coordinating, and managing a project through the MDOT SHA's Plan Development Process. The Project Manager may or may not be the individual doing the actual design.

PS&E: For utility relocations performed by the Utility Company, PS&E stand for Plans, Specifications, & Estimate. For utility relocation work incorporated into MDOT contracts, PS&E stand for Plans, Special Provisions, & Estimate. A Utility PS&E refers to a completed utility package that is used by the MDOT to: determine cost responsibility to reimburse the Utility Company or; incorporate into the transportation project for contractors to bid on the utility relocation work.

Ramp: A short roadway connecting two or more legs of an interchange, intersection, or a frontage road and main lane of a highway.

Relocation(s): The adjustment, removing & reinstalling, or replacement of a Utility Facility as necessary in order to accommodate an MDOT SHA project for either or both of the following reasons: (a) a physical conflict between the Utility Facility and the MDOT SHA project (including its construction, operation, maintenance or use), and/or (b) an incompatibility between the MDOT SHA project as designed and the Utility Facility based on the requirements of the applicable Utility Standards and/or applicable Governmental Requirements (even though there is no physical conflict).

Rest Area: A roadside area with parking facilities separated from the roadway provided for motorists to stop and rest for short periods. It may include drinking water, toilets, tables and benches, telephones, information and other facilities for travelers.

Restoration: The reconstruction of the highway rights-of-way disrupted by the construction of, maintenance, or repair of a utility facility with the resultant effects by which the highway is returned to a condition as good as or better than its original condition.

Right-of-Way (ROW or R/W): A general term denoting land, property, interest therein, usually in a strip acquired or devoted to transportation purposes.

Roadside: A general term denoting the area adjoining the outer edge of the roadway. Extensive areas between the roadways of a divided highway may also be considered roadside.

Roadway: The portion of a highway, including shoulders, for vehicular use. A divided highway has two or more roadways.

Shall: denotes a requirement that is mandatory whenever the criterion for conformance with the specification requires that there be no deviation. Refer to Merriam-Webster's Online Dictionary, https://www.merriam-webster.com/dictionary/shall.

Should: denotes a guideline or recommendation whenever noncompliance with the specification is permissible. Refer to Merriam-Webster's Online Dictionary, https://www.merriam-webster.com/dictionary/should.

Shoulder: The portion of the roadway continuous with the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of base and surface courses.

Sidefill: Backfill alongside a pipe, ductline, conduits, cables, etc.

State Infrastructure Executive Committee (SIEC): SIEC is a committee that has governance of policy and procedures for interoperability of State, local and Federal radio systems.

Site: an area of land or location where construction is planned, people & equipment are working or includes any vegetation activity (i.e., mowing, chemical control, pruning, and tree removal) is being performed, on or adjacent to MDOT SHA's right-of-way.

Sleeve: A short casing through a wall, pier, abutment, or similar highway structure. It can also refer to a casing underneath a roadway used for enclosing a carrier pipe, conduit, or duct.

Special Provisions: Special provisions are included in MDOT SHA's contract documents as required to define work or procedures not covered in the Standard Specifications For Construction And Materials, and as necessary to supplement or modify items in the Standard Specifications For Construction And Materials.

Stringers – In MDOT SHA bridges, both beams and girders are commonly referred to as stringers. Beams are rolled steel less than 36" in height. Girders are fabricated steel with two flange plates welded to a web plate, 36" or greater in height.

Subsurface Utility Engineering (SUE): According to the *ASCE Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data*, current edition, SUE is "a branch of engineering practice that involves managing certain risks associated with utility mapping at appropriate quality levels, utility coordination, utility relocation design and coordination, utility condition assessment, communication of utility data to concerned parties, utility relocation cost estimate, implementation of utility accommodation policies, and utility design."

Surety: Security against loss or damage or for the fulfillment of an obligation for the full and complete performance of the provisions in a permit or agreement.

Test Hole: A Test Hole is a small excavation used to expose underground utilities to ascertain the horizontal and vertical location and/or other attributes of the facility used in the design of a project.

Test Pit: A Test Pit is an excavation made to examine the subsurface conditions and/or to ascertain the horizontal and vertical location of underground utility facilities on a construction site. Test pits are dug prior to the actual construction.

Traffic Barrier: A device used to prevent a vehicle from striking a more severe obstacle or feature located on the roadside or in the median, or to prevent crossover median accidents. It can also refer to a temporary device used to prevent vehicular access into construction or maintenance work zones and to redirect an impacting vehicle so as to minimize damage to the vehicle and injury to the occupants, while providing worker protection.

Traffic Control Plan: A plan for handling traffic through a specific highway or street work zone or project.

Transmission Lines: The part of a utility facility connecting its main energy or material source(s) with its distribution system, to which individual customers usually are not connected.

Transportation Business Unit (TBU): Individually, the MDOT Secretary's Office (MDOT TSO), the Maryland Aviation Administration (MDOT MAA), the Maryland Transit Administration (MDOT MTA), the Maryland Port Administration (MDOT MPA), the Maryland State Highway Administration (MDOT SHA) or the Maryland Transportation Authority (MDOT MDTA) of the Maryland Department of Transportation.

Transportation Purpose: Any MDOT TBU asset, project, or program which supports Maryland's transportation goals.

Traveled Way: Also called traffic lane, is the designated widths of roadway pavement (exclusive of shoulders and marked bicycle lanes) marked to separate opposing traffic or vehicles traveling in the same direction or traffic occupying other traffic lanes. These lanes include through travel lanes, auxiliary lanes, turn lanes, weaving lanes, passing lanes and climbing lanes. They provide space for licensed motor vehicles and, in some cases, bicycles.

Trench or Open Cut: A method of installing utilities in an open excavation.

Trenchless Technology: The use of directional boring, horizontal drilling, tunneling, and other techniques used in the construction or installation of underground portions of facilities to minimize disruption and damage to right-of-way.

Utility: A privately, publicly, or cooperatively owned line, facility or system for producing, transmitting, or distributing communications, cable television, power, electricity, light, heat, gas, oil, crude products, water, steam, waste, storm water not connected with highway drainage, or any other similar commodity, including any fire or police signal system or street lighting system, or an emerging technology, which directly or indirectly serves the public. The term utility includes those utility-type facilities which are owned or leased by a government agency for its own use, or otherwise dedicated solely to governmental use. The term utility shall also mean the Utility Company inclusive of any wholly owned or controlled subsidiary. The term "Utility", when capitalized, may also be used to refer to the owner of any above described utility or utility facility.

Utility Service Lines (aka: Utility Service, Service Lines, Service Connections, House Connections): A water, gas, power, communication, sanitary sewer (or any other similar commodity) line that extends from the main or primary utility facility into an adjacent property and that is used to serve the property.

Utility Standards: includes all Governmental Requirements; all applicable utility industry requirements; and all applicable MDOT SHA and Utility standards, policies, and procedures.

Utility System: An interdependent group of Facilities forming integral part of a network, or any portion thereof, specifically for transmission and/or distribution of a utility product (e.g. water, sewer, electricity, gas, telecommunications, etc.), that is or are directly applicable to or impacts the Utility and/or its customers located within Utility's service area at any time, presently or in the future.

Vent: An appurtenance to discharge gaseous contaminants from casings.

1.02 PURPOSE

The Maryland Department of Transportation State Highway Administration (MDOT SHA) has the responsibility to maintain highway right-of-way under its jurisdiction and to preserve the operational safety, integrity, and function of the highway facility. Since the manner in which utilities cross or otherwise occupy highway right-of-way can materially affect the safe operation, maintenance, and appearance of the highway, it is necessary that such use and occupancy be authorized and reasonably regulated. The MDOT SHA has authority to regulate the use of utilities within highway rights-of-way generally through its authority to designate and to control the use of right-of-way acquired for public transportation purposes.

Utilities have various degrees of authority to install their lines and facilities on the right-of-way of public roads and streets. Like the MDOT SHA, their authorities depend upon state laws and regulations. Utilities also depend upon franchises, local laws, and ordinances, which may differ in the several political subdivisions within the state.

It is in the public interest for utility facilities to be accommodated on highway right-of-way when such use and occupancy do not adversely affect highway safety, construction, maintenance, or operations. These include:

- Public safety and protection
- Optimal utilization of MDOT SHA right-of-way
- Future maintenance and development of the MDOT SHA highways and bridges.

- Free and safe flow of traffic
- Compliance with applicable Federal, State, and local laws and regulations including this utility manual.

In this respect, policies outlining safe and rational practices for accommodating, installing, and relocating utilities within highway right-of-way are of valuable assistance to the MDOT SHA and the utility companies. The policies and processes herein have been developed to establish requirements for the accommodation of and use by new and existing utilities. This includes regulating the location, installation, and adjustment of utility facilities on MDOT SHA right-of-way.

Coordination is a term so commonly used in highway and utility projects that its meaning can become diluted or confused. Coordination or the active effort to share information and interact productively with others should occur in all phases of the development of a project. Benefits from coordination can be found during each phase (planning, design, preliminary engineering, construction, operation, and maintenance). History has shown that doing early coordination and continuing coordination through the life of a project, is the most effective tool to:

- Identify and resolve issues as early as possible
- Eliminate arbitrary and unnecessary utility relocations
- Minimize costly unexpected issues
- Facilitate timely utility relocations

Working together to accomplish the overall goals of a project can enable the highway agency and the Utility Company to derive a better solution than each would have discovered separately. The policies and processes in this Utility Manual have been developed to establish coordination requirements for MDOT SHA projects. This includes identifying milestones for projects; coordination roles and responsibilities for MDOT SHA and the utilities; and coordination requirements for certain specific MDOT SHA facilities such as bridges and traffic structures.

This Utility Manual supersedes all previous editions. The information and references in this Utility Manual is accurate as of the date of this manual. Generally, SHA requirements and policies regarding utility relocation, adjustment, and accommodation have remained consistent over the years. However, from time to time certain laws, regulations and/or policies may be changed which could affect these policies.

1.03 SCOPE

This Utility Manual establishes and prescribes uniform policies and standards for; and covers all utility related activities within the MDOT SHA rights-of-way or MDOT SHA owned properties. These utility related activities include, but are not limited to installation, accommodation, project coordination, relocation, maintenance, and locating on MDOT SHA's rights-of-way.

1.04 APPLICABILITY

A) This Utility Manual applies to all utilities, privately or publicly owned, including local governments and municipalities.

B) All utilities, whether privately or publicly owned, will be required to comply with the policies and standards of this Utility Manual when occupying or performing any utility related activity on any part of MDOT SHA’s rights-of-way.

1.05 AUTHORITY

1.05.01 Maryland Law - MDOT SHA

A) Under § 8-204 of the Annotated Code of Maryland, Transportation Article, the MDOT SHA is required to establish and maintain a State highway system. The right-of-way is devoted exclusively to public transportation purposes. This requires the MDOT SHA to control non-highway uses of MDOT SHA rights-of-way so as to preserve the operational safety, functionality, and aesthetic quality of the highway system. The authority for this requirement flows from in that proper maintenance of a highway facility requires, among other things, adequate control over non-highway facilities, such as utilities which may be located within the right-of-way.

B) Utility use of highway right-of-way is not considered to be a use for a transportation purpose.

C) § 8-646 of the Annotated Code of Maryland, Transportation Article allows the MDOT SHA to permit certain non-highway uses of the right-of-way which are determined by the MDOT SHA to be in the public interest provided such uses do not impair the highway or interfere with the free and safe flow of traffic thereon.

1. Permission, when granted, to place utility facilities within MDOT SHA's rights-of-way is revocable at any time by the MDOT SHA.
2. Any such revocation will have no bearing on any other facility of the Permittee under a statutory right that may have been granted to the Permittee under the Annotated Code of Maryland, Public Utilities Article.

1.05.02 Federal Laws and Regulations

A) Section 106 of Title 23, United States Code, requires that the Federal Highway Administration (FHWA) and the State enter into an agreement documenting the extent to which the State assumes the responsibilities of FHWA under Title 23. The Stewardship/Oversight Agreement formalizes these delegated responsibilities and agreements to address how the Federal-aid highway program will be administered in the State.

B) Laws dealing with utility relocation and accommodation are contained in the United States Code (U.S.C.), title 23, sections 123 and 109(l)(1), respectively.

C) Regulations dealing with utility relocation and accommodation matters are based upon laws contained in 23 U.S.C. and are found in the Code of Federal Regulations (CFR), title 23, chapter I, subchapter G, part 645, subparts A and B. These regulations will be cited in this Utility Manual as 23 CFR 645 and are incorporated into this Utility Manual by reference.

D) Under 23 CFR 645, the Federal Highway Administration (FHWA) has authority over all highways utilizing Federal funds. Refer to the FHWA Program Guide (FAPG): Utility Relocation and Accommodation On Federal-Aid Projects for additional information. These FAPG guidelines are applicable to Maryland roads regardless of funding status.

1. FHWA approval needed for non-highway use and occupancy of interstate per 23 CFR 1.23(c).

2. Where the MDOT SHA does not have legal authority to regulate highway use by Utilities and private lines, it is the practice of the MDOT SHA to enter into formal agreements with local officials who have such authority. The agreements will incorporate by reference the MDOT SHA's latest approved Utility Manual. The project agreement between the MDOT SHA and the FHWA on all such Federal-aid highway projects shall contain a special provision incorporating the formal agreements with the responsible local officials.

1.05.03 AASHTO Policy

There are two AASHTO publications which are incorporated into this Utility Manual by reference:

A) "A Policy on the Accommodation of Utilities Within Freeway Right-of-Way."

1. AASHTO revised its policy covering utilities within freeway right-of-way in February 1989. This revised AASHTO policy was generally consistent with the FHWA's regulations in many respects but continued to prohibit longitudinal utility installations on freeway right-of-way, except in special cases under strictly controlled conditions. For this reason, the FHWA opted not to adopt the AASHTO policy as a Federal standard. Many States opted to continue with the AASHTO Policy prohibiting longitudinal utility installations, except in special cases under strictly controlled conditions. Maryland has opted to maintain AASHTO's Policy on the Accommodation of Utilities Within Freeway Right-of-Way and is still applicable to this Utility Manual.

B) "A Guide for Accommodating Utilities Within Highway Right-of-Way."

1.05.04 Maryland Law - Utilities

Just as the Transportation Article of the Annotated Code of Maryland establishes MDOT SHA's authority to manage the rights-of-way of the state highway system, the Public Utilities Article of the Annotated Code of Maryland provides the Utilities various degrees of authority to install their lines and facilities on the right-of-way of public roads and streets.

However, the Public Utilities Article of the Annotated Code of Maryland provides for limited authority of the Utilities and further reinforce MDOT SHA's authority to manage the rights-of-way of the state highway system. The following sections are some, but not all, that may be referred to for more information:

- § 5-103 Franchises
- § 7-102 Gas Companies
- § 7-103 Electric Companies
- § 7-105 Water Companies
- § 8-103 Telecommunication Companies

1.06 ENFORCEMENT

The Transportation Article of the Annotated Code of Maryland, Section 8-646(b)(2), states that "work done under the permit shall be performed to the satisfaction of the Administration and under its supervision." The Administration is defined as MDOT SHA. This MDOT SHA responsibility of review and supervision is accompanied by certain enforcement powers which are set forth in the following provisions:

A) The MDOT SHA has the authority to suspend utility work, on any project, wholly or in part, if in its judgment, the utility fails to comply with the terms of a resource sharing agreement and/or of the Complete Authorized Utility Permit.

1. In urgent or emergency situations, the MDOT SHA may request law enforcement to have utility workers vacate the MDOT SHA right-of-way.

B) The Transportation Article of the Annotated Code of Maryland, Section 8-646(c), states that "*The Administration may apply to the Circuit Court in the subdivision in which the violation occurred or is threatened for appropriate injunctive relief.*" The Deputy Administrator(s) has the authority to initiate this action.

C) Utility Companies are not relieved from any legal or contractual obligation to comply promptly with any order or request of the MDOT SHA to perform the work necessary to relocate its facilities.

1. Emergencies and Similar Situations

a) Any situation and/or condition occurring within MDOT SHA's right-of-way requiring MDOT SHA forces to cure immediately or deem an emergency, the Utility Owner shall coordinate any work necessary with restoring the site condition to a safe level determined by the MDOT SHA.

b) The Utility Owner shall respond to the situation and/or as soon as possible and perform any work, including but not limited to, relocations, adjustments, or other work necessary to set up a temporary by-pass to their facilities as required to remedy the situation.

c) The Utility Owner will be liable for including, but not limited to any harm or damages resulting from the condition if they fail to respond, coordinate, or refuse any cure such as relocate, adjust, or install a temporary by-pass of their facilities in order for the MDOT SHA to complete the required repairs to the right-of-way.

2. Meeting MDOT SHA project schedules

a) In accordance with the MDOT SHA's Utility Permit General Provisions, the MDOT SHA shall require the Utility to reimburse the MDOT SHA for any contractor's delay claim received on an MDOT SHA project for which, if in MDOT SHA's judgment, the utility failed to relocate its facilities in a timely manner resulting in the MDOT SHA contractors delay.

b) MDOT SHA may potentially suspended future Utility Permits until past non-compliance is resolved.

1.06.01 Notice

In the event the Utility should: be acquired by another company; merge with another company; become a subsidiary of another company; acquire another company as a subsidiary; or any other change in the Utility's ownership or control; or buy, sell, acquire, transfer, or assume any facilities within MDOT SHA's right-of-way; or sell, buy, acquire, transfer, or assume any facilities installed or constructed under any Utility Permit or agreement with the MDOT SHA; the Company shall notify the MDOT SHA, in writing, within 20 business days of the event or action.

1.06.02 Default

In the event that a Utility or its successors and/or assigns fails to abide by the terms of (i) an agreement between the Utility and the MDOT SHA and/or (ii) the Complete Authorized Utility Permit issued to the Utility by the MDOT SHA, the Utility and/or its successor and assigns shall be considered in default. The MDOT SHA shall have the right to:

A) Require the Utility to remove all its facilities or any portion thereof in accordance with Subsection 6.14 (B) Out-of-Service and Deactivated Facilities Requiring Removal.

B) Require the Utility to relinquish ownership and possession of all its facilities and any property interests to the MDOT SHA or any portion thereof in accordance with Subsection 6.14 (C) (2) (c) Deactivating or Placing Facilities Out-of-Service.

C) Apply to the Circuit Court in the subdivision in which the violation occurred or is threatened for appropriate injunctive relief in accordance with the Annotated Code of Maryland, Section 8-646(c).

1.07 INDEMNIFICATION

A) The Utility shall indemnify MDOT SHA, and hold MDOT SHA harmless, in any law suit or claim that arises out of the Utility's failure to comply with the requirements of this Utility Manual and/or any Complete Authorized Utility Permit. At the direction of the MDOT SHA, the Utility shall correct any deficiencies, at their sole cost and expense, where the MDOT SHA determines that the work was not completed in accordance with the prescribed MDOT SHA Standards and Specifications; this Utility Manual; and/or the terms of any Complete Authorized Utility Permit.

B) Nothing in this Utility Manual or any Complete Authorized Utility Permit shall constitute a waiver of any immunity to which the State of Maryland, MDOT or MDOT SHA may be entitled under any federal law or under the laws of the State of Maryland, as they may be amended from time to time.

1.08 GENERAL GUIDANCE DOCUMENTS

A) Any utility work in this Utility Manual shall be in complete conformance with specifications, standards, provisions, and policies of the following agencies, organizations institutes, publications, and documents as applicable to the type of utility facility and/or type of work:

- FHWA Program Guide (FAPG): Utility Relocation and Accommodation On Federal-Aid Projects
- A Policy on the Accommodation of Utilities Within Freeway Right-of-Way (AASHTO)
- A Guide for Accommodating Utilities Within Highway Right-of-Way (AASHTO)
- USDOT - Pipeline and Hazardous Materials Safety Administration (PHMSA)
- Maryland Public Service Commission (PSC)
- American Petroleum Institute (API)
- American National Standards Institute (ANSI)
- American Society for Testing and Materials (ASTM)
- American Water Works Association (AWWA)
- American Gas Association (AGA)
- American Welding Society (AWS)
- American Society of Mechanical Engineers (ASME)
- American Society of Civil Engineers (ASCE)

- National Electric Code (NEC)
- National Electric Safety Code (NESC)
- National Association of Corrosion Engineers (NACE)
- National Fire Protection Association (NFPA)
- Standard Specifications For Construction And Materials
- Supplemental Specifications and Provisions
- Guidelines for Traffic Barrier Placement and End Treatment Design
- 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control
- Aesthetic Bridges - Users Guide
- Approved Proprietary Retaining Wall List
- Approved Proprietary Noise Barrier Systems
- Bicycle Policy and Design Guidelines
- Book of Standards For Highway & Incidental Structures
- CAD Standards
- Category Code Book
- Federal Highway Bridge Program Guidelines For Local Governments
- Guidelines for Application of Rumble Strips and Rumble Stripes
- Highway Drainage Manual
- Landscape Guidance Documents
- Maryland Manual on Uniform Traffic Control Devices - 2011 Edition
- Maryland SHA Roundabout Design Guidelines
- Maryland State Highway Administration Construction Manual
- Office of Structures General Notes
- Pavement & Geotechnical Design Guide
- PONTIS Element Data Collection Manual
- Price Index
- Reforestation Law Summary
- Roadside Tree Law Summary
- MDOT SHA's Accessibility Guidelines for Pedestrian Facilities along State Highways
- SHA Design-Build Manual
- SHA Field Guide for Erosion and Sediment Control
- Sign Standard Book
- Signals
- Standard Specifications for Subsurface Explorations
- Structural Standards and Details
- Traffic Control Devices Design Manual
- Uniform Traffic Control Devices for Private Property
- AASHTO’s Policy on Geometric Design of Highways and Streets
- MDOT SHA Utility Manual
- MDOT SHA Utility Procedures Manual

B) In addition to the agencies, organizations, institutes, and publications, documents referenced in the previous paragraph, design and construction associated addressed in the various Chapters of this Utility Manual shall be performed in complete conformance with, and particular attention to, the Guidance Documents identified in the respective Chapters as applicable to the type of utility facility and/or type of work.

C) Whenever MDOT SHA's Standard Specifications For Construction And Materials is referred to in this Chapter or this Utility Manual, the latest version of the Supplemental Specifications and Provisions shall be reviewed to ensure the most current specification is used.

1.09 CONTROLLED ACCESS HIGHWAYS

There is a direct relationship which exists between sections § 8-619 (c), § 8-620 and § 8-621 concerning the access control of highways and the provisions under section § 8-646 for permitted non-highway uses. Proposed non-highway uses cannot be of a nature that would negate the general requirement regarding the safe and efficient operations of the highway.

Therefore, it is implicit in the public interest for the MDOT SHA to fully control access on certain highways to maintain the integrity of these freeways and parkways. And also to manage utility use of the right-of-way to locate the utility facilities in a manner that does not interfere with the safe and efficient operations of the highway on all other roadways in the highway system.

MDOT SHA's Highway Location Reference (HLR) identifies which highways and sections of highway are Fully Controlled Access, Partially Controlled Access, and Non-Controlled Access.

A) Controlled Access

Controlled Access is the condition where the right of owners or occupants of abutting land or other persons to access in connection with a highway is fully or partially controlled by the MDOT SHA. The higher classifications of highways will usually incorporate access control. Controlled access limits are denoted on MDOT SHA drawings and plats by the words "Right-of-way Line of Through Highway" at the right-of-way line or on a line inside the right-of-way line.

B) Fully Controlled Access - The MDOT SHA exercises its authority to fully control access to give preference to through traffic by prohibiting crossings at grade and direct private entrance connections. Interchanges are used to provide access connections to selected public roads. These controlled access designations severely restrict the use of highway rights-of-way for any purpose other than its primary function.

Utility facilities generally may cross perpendicular to these highways in accordance with the requirements of this Utility Manual. All utility facilities are strictly prohibited from longitudinal occupancy in fully controlled access rights-of-way with the exception of certain facilities under a resource sharing agreement. Refer to Section 6.15 – RESOURCE SHARING for further guidance.

Freeways, and generally Parkways under Maryland law, are fully controlled access highways. (See Section 1.10 - MDOT SHA FUNCTIONAL CLASSIFICATION OF ROADWAYS (Freeway & Parkway) & Section 6.03 - Fully Controlled Access Roadways for further guidance.)

C) Partially Controlled Access - The MDOT SHA exercises its authority to control access to give preference to through traffic to a degree that, in addition to access connections with selected public roads, there may be some crossings at grade and some private entrance connections.

Utility facilities generally may cross perpendicular to these highways in accordance with the requirements of this Utility Manual. Utility facilities may be considered for longitudinal occupancy in these highway rights-of-way in accordance with the requirements of this Utility Manual, the recommendation of the appropriate District Engineer or their approved designee, and concurrence from the Statewide Utility Engineer.

Expressways are partially controlled access highways. In addition, some Parkways and Major roadways in urban areas may also be partially controlled access. (See Section 1.10 - MDOT SHA FUNCTIONAL CLASSIFICATION OF ROADWAYS (Parkway, Expressway & Major) & Section 6.04 - Partially Controlled Access Roadways for further guidance.)

D) Non-controlled Access - Owners or occupants of abutting lands or other persons are allowed to have direct access to or from the roadway by an MDOT SHA Access Permit. Utility facilities may cross perpendicular to these highways in accordance with the requirements of this Utility Manual and by an MDOT SHA Utility Permit. Utility facilities are allowed longitudinal occupancy in these highway rights-of-way in accordance with the requirements of this Utility Manual and by an MDOT SHA Utility Permit.

Collector and Local roadways are non-controlled access highways. In addition, Major roadways are generally non-controlled access highways. (See Section 1.10 - MDOT SHA FUNCTIONAL CLASSIFICATION OF ROADWAYS (Major, Collector, & Local) & Section 6.05 – Non-Controlled Access Roadways for further guidance.)

1.10 MDOT SHA FUNCTIONAL CLASSIFICATION OF ROADWAYS

When selecting a roadway classification, the area or roadway should best fit the descriptions contained within this Utility Manual.

Freeway: A freeway is a divided roadway with grade separations at intersecting roadways (no crossings at grade) and full control of access. This definition applies to toll as well as non-toll roads. Freeway classification is further subdivided into A and B.

- Freeway A has greater visual complexity and high volumes. This is common in urban areas and will operate through some of the early evening hours of darkness at or near design capacity.
- Freeway B represents all other divided roadways with full control of access.

Parkway: A parkway is a divided major roadway for through traffic. Under § 8-619 (c), § 8-620 and § 8-621 of the Annotated Code of Maryland, Transportation Article, parkways may have the same classification as a freeway with grade separations at intersecting roadways (no crossings at grade) and full control of access. However, some parkways may have the same classification as an expressway with partial control of access and generally with interchanges at major crossroads.

Expressway: An expressway is a divided major roadway for through traffic, with partial control of access and generally with interchanges at major crossroads.

Major: A major roadway is a principle "arterial," "thoroughfare," "preferential", or "Other Principle Arterial" (OPA) for through flow of traffic. These roadways connect areas of principal traffic generation and are sometimes subdivided into primary and secondary.

Collector: A collector roadway services between major and local roadways. These are streets used mainly for traffic movements within residential, commercial and industrial areas that give direct service to abutting properties.

Local: A local roadway is direct access to residential, commercial, industrial or other property. They make up a large percentage of the total street system but carry a small proportion of vehicular traffic.

1.11 MDOT SHA/UTILITY INTERACTION

The MDOT SHA is comprised of three main areas of responsibility. These are: Administration; Operations; and Planning, Engineering, Real Estate, and Environment. In addition, the MDOT SHA has divided the state into seven regional areas or Engineering Districts for more organizational effectiveness of resources. The seven Engineering Districts are under the Operations area of responsibility. Refer to MDOT SHA's Organizational Chart and the ENGINEERING DISTRICTS MAP for additional information.

Each District Office is also comprised several areas of responsibility which includes Project Development, Right-of-Way, Construction, Traffic, and Maintenance. The District Utilities Sections are under the Project Development area of responsibility.

The District Utilities Sections are responsible for the direct coordination and compliance of all utility activity within their respective districts. This includes, but not limited to:

- Reviewing, issuing, inspecting, and tracking utility permits.
- Reviewing, issuing, inspecting, and tracking Traffic Control Permits.
- Coordinating with Utility Companies during utility emergencies.
- Reviewing and coordinating utility relocations on MDOT SHA construction and maintenance projects.
- Coordinating, reviewing, and inspecting Engineering Access Permits.
- Reviewing, issuing, inspecting, and tracking other permits as directed by the appropriate District Engineer or their approved designee of their respective district.

The District Utilities Sections also coordinates with the other sections within their respective district and MDOT SHA design offices for capital improvement projects, and/or proposed utility work as needed for individual projects or permits.

The District Utility Engineer (DUE) and the Assistant District Utility Engineer (ADUE) are the initial liaisons between MDOT SHA and utility companies, local governments, municipalities, and contractors.

Each District has its level of delegated authority for approval for matters or items that arise in their respective districts. The level of delegated authority for approval of these various matters or items may include Deputy District Engineers, Assistant District Engineer(s) for Project Development, Traffic, Construction, and Maintenance; and/or District Utility Engineers. Therefore, wherever the term "appropriate District Engineer" is used throughout this Utility Manual; it shall mean the appropriate District Engineer and/or their approved designee(s) for that particular district.

A) The DUE of the district in which work will take place shall be the Utility Company's initial point of contact for any activity performed by the Utility in that district.

B) The Utilities Section of MDOT SHA's District Offices are responsible for the oversight and control of utility installations (Utility Permits) within the highway right-of-way.

C) During project planning, project development, and construction phases of MDOT SHA's projects, DUE's and Assistant DUE's provide organizational contact and coordination support between utility companies and highway project managers as well as providing guidance and assistance to project development staff as they address utility issues relating to their projects.

D) Specific coordination requirements are addressed in CHAPTER 3: PERMITS & CHAPTER 8: PROJECT COORDINATION

E) Plans or bills submitted directly to headquarters without the DUE's approval will be returned to the district.

CHAPTER 2

GENERAL PROVISIONS

2.01 DESIGN

2.01.01 Guidance Documents for Design

A) All utility design, accommodation, construction, and maintenance shall be in complete conformance with specifications, standards, provisions, and policies of Section 1.08 - GENERAL GUIDANCE DOCUMENTS.

B) In addition to the documents referenced in the previous paragraph, all utility design, accommodation, construction, and maintenance shall be in complete conformance with, and particular attention to, the specifications, standards, provisions, and policies of the following agencies, organizations, institutes, and publications as applicable to the type of utility facility and/or type of work:

- USDOT - Pipeline and Hazardous Materials Safety Administration (PHMSA)
- Maryland Public Service Commission (PSC)
- Book of Standards For Highway & Incidental Structures
- American Petroleum Institute (API)
- American National Standards Institute (ANSI)
- American Society for Testing and Materials (ASTM)
- American Water Works Association (AWWA)
- American Gas Association (AGA)
- American Welding Society (AWS)
- American Society of Mechanical Engineers (ASME)
- American Society of Civil Engineers (ASCE)
- National Electric Code (NEC)
- National Electric Safety Code (NESC)
- National Association of Corrosion Engineers (NACE)
- National Fire Protection Association (NFPA)
- Standard Specifications For Construction And Materials
- Supplemental Specifications and Provisions
- Guidelines for Traffic Barrier Placement and End Treatment Design
- MDOT SHA's Accessibility Guidelines for Pedestrian Facilities along State Highways
- Bicycle Policy and Design Guidelines
- AASHTO's Policy on Geometric Design of Highways and Streets
- Design Guidelines: Utility Coordination Using Thinking Beyond the Pavement Principles
- MDOT SHA Utility Manual

C) Whenever MDOT SHA's Standard Specifications For Construction And Materials is referred to in this Chapter or this Utility Manual, the latest version of the Supplemental Specifications and Provisions shall be reviewed to ensure the most current specification is used.

2.01.02 General Design Requirements

A) The utility shall be responsible for the design of the utility facility to be installed within the highway rights-of-way or attached to a highway structure. The MDOT SHA will review the utility's proposal with respect to the location of the utility facilities to be installed and the manner of installation or attachment. This design and approval process shall include the measures to be taken to preserve the safe and free flow of motorized & non-motorized users; structural integrity of the roadway or highway infrastructure; ease of highway maintenance; appearance of the highway; and the integrity of the utility facility.

B) The Utility shall comply with all Federal, State, and local laws, regulations and ordinances applicable to their activities in addition to rules and regulations referred to herein. This shall include any highway design standards which the MDOT SHA shall deem necessary to provide adequate protection to the highway users, its operational efficiency, safety considerations, appearance, and maintenance.

C) The Utility shall comply with all requirements referred to herein this Utility Manual. Particular attention shall be given to the following chapters:

- CHAPTER 5: ENVIRONMENTAL
- CHAPTER 6: ACCOMMODATION
- CHAPTER 9: BRIDGES AND OTHER STRUCTURES
- CHAPTER 10: SIGNALS, SIGNS, AND OTHER TRAFFIC STRUCTURES

D) Compliance with current industry codes in the above referenced documents shall include, but not limited to, the following requirements:

1. Electric power and communication facilities shall conform to the currently applicable National Electric Code and National Electric Safety Code.

2. Water lines shall conform to the currently applicable Specifications of the American Water Works Association.

3. Pressure pipelines shall conform with the currently applicable section of The Standard Code for Pressure Piping of the American National Standards Institute; PHMSA Standards, Title 49 CFR, Parts 191, 192 and 195; and applicable industry codes.

4. Liquid petroleum pipelines shall conform to the currently applicable recommended practice of the American Petroleum Institute for pipeline crossings under railroads and highways.

5. Any pipeline carrying hazardous material shall conform to the rules and regulations of the USDOT - Pipeline and Hazardous Materials Safety Administration governing the transportation of such materials.

E) All utility installations within MDOT SHA rights-of-way and attachments to MDOT SHA structures shall be of durable material designed for long service life expectancy and relatively free from routine servicing and maintenance.

F) On new installations or adjustments of existing utility lines, provisions shall be made for known or planned expansion of the utility facilities and the highway infrastructure, giving particular attention to those located underground or attached to highway structures. They must be planned so as to minimize hazards and interference with highway operations and safety when additional overhead or underground lines are installed at some future date.

G) The Utility is responsible for obtaining any necessary permits, including, but not limited to, MDOT SHA utility permit, environmental permit, Traffic Control Permit, local government, or municipal permit prior to performing any work on MDOT SHA's right-of-way or structures.

2.01.03 Aerial and Above Ground Facility Design Requirements

A) Any appurtenance to a utility's underground facility which extends above the surface of the ground shall comply with Section 2.01.04 - Clear Zones.

B) All poles, ground mounted facilities, and any appurtenances to a utility's underground facility which extends above the surface of the ground are prohibited within areas of controlled access rights-of-way.

C) Ground mounted utility facilities shall be of a design compatible with the visual quality of the specific highway section being traversed. Refer to Section 2.05 - Scenic Enhancement for further guidance.

D) Wood poles shall be used except where steel poles are necessary to eliminate dangerous or difficult guying. Damaged or rotted poles will be replaced as quickly as possible.

E) All poles, ground mounted facilities, and any appurtenance to a utility's underground facility which extends above the surface of the ground shall comply with the MDOT SHA's ADA requirements. Refer to Section 2.06 - ADA (AMERICANS WITH DISABILITIES ACT) REQUIREMENTS for further guidance.

F) All manholes, handholes, pull boxes and junction boxes shall comply with MDOT SHA's Standard Specifications For Construction And Materials, Section 811 - Electrical Handholes, Manholes, Pull and Junction Boxes and/or Section 305 - Miscellaneous Structures.

1. Any manhole, handhole, pull box, or junction box placed within MDOT SHA structures, roadway, shoulder, or Clear Zone shall be traffic bearing and constructed of concrete.
2. Any manhole, handhole, pull box, or junction box made of any other material may be permitted, at MDOT SHA's sole discretion, in areas with positive traffic barrier or in other areas where traffic is unable to impact the structure.
    a) MDOT SHA's written approval shall be required prior to installation within MDOT SHA rights-of-way.

2.01.04 Clear Zones

A clear zone is the total roadside border area, starting at the edge of the travel lane, available for safe use by errant vehicles departing the highway. This area may consist of a shoulder, a recoverable slope, and/or a traversable but non-recoverable slope, and a clear run-out area. (A "recoverable" fill slope is defined as no steeper than 4:1; a "traversable but non-recoverable" slope is steeper than 4:1 but no steeper than 3:1 (a "critical" slope is steeper than 3:1 and considered an obstacle); cut slopes as steep as 3:1 are considered recoverable). The desirable clear zone width, from a roadside safety standpoint, is as wide as cost-effectively possible. However, some practical value needs to be established for design purposes. Design clear zone values have been determined and are dependent upon traffic speeds and the roadside geometry; they are given in TABLE 2.01.04: DESIGN CLEAR ZONE WIDTHS. See Guidelines for Traffic Barrier Placement and End Treatment Design, Section III – Clear Zone Concepts for further guidance.

DESIGN CLEAR ZONE WIDTHS			
Design Speed	**Slope 4:1 or Flatter (Recoverable)**	**Slope Steeper Than 4:1 to 3:1**	**Slope Steeper Than 3:1**
≤ 40 MPH*	16 feet	Traversable / Non-Recoverable**	Critical
45 - 50 MPH	24 feet	Traversable / Non-Recoverable**	Critical
≥ 55 MPH	30 feet	Traversable / Non-Recoverable**	Critical

* Off National Highway System (NHS): Clear zones do not normally apply to roadways off the NHS unless warranted by Accident History.

** The slope is considered acceptable if the remainder of the design clear zone (subtracting the width available at the top of the slope, but a minimum of 10ft) is available at a 6:1 or flatter slope beyond the toe of the 3:1 slope.

TABLE 2.01.04: DESIGN CLEAR ZONE WIDTHS

2.01.05 Underground Facility Design Requirements

A) Underground installations shall be designed such that the facility can be located without disturbing the roadway infrastructure. If the facility installed is a "non-toneable" piping, conduit, or direct buried lines, underground location devices shall be installed with the utility facility and; if in the opinion of the MDOT SHA, underground markers and/or surface markers; shall be placed in conjunction with the utility facility installation in accordance with Section 6.07 - SURFACE MARKERS & UNDERGROUND MARKERS/LOCATION DEVICES.

B) The utility's design of any manhole, vault, or similar underground appurtenance is subject to the prior approval of the MDOT SHA.

1. On crossings, such appurtenances shall normally be located between the ditch and right-of-way line with the top elevation of the cover of any access opening being level with or below the finished grade.

2. Such appurtenances must be constructed in a manner and at locations that will not interfere with maintenance of the highway.

3. Any manhole, vault, or similar underground appurtenance within the highway clear zone shall be traffic bearing and in accordance with Standard Specifications For Construction And Materials, SECTION 305 — MISCELLANEOUS STRUCTURES.

a) Manhole Covers within the highway clear zone shall be in accordance with the Book of Standards For Highway & Incidental Structures, MD Standard No. 383.32, Type "A" and with the Standard Specifications For Construction And Materials, Section 909.04 which requires compliance with ASTM A48 Class 30B.

C) Piping shall comply with the following requirements:

1. Pipes shall comply with all other requirements of this Section 2.01- DESIGN.

2. Pipe utilized for the transportation of gases other than natural gases, all petroleum products, all other flammable products and explosive or hazardous substances shall be made of steel. Low and medium pressure natural gas distribution lines may be made of either steel or polyethylene.
3. Other utilities may be transported in pipe meeting the utility standard for the material being transmitted.
4. The pipe classification, minimum yield strength, wall thickness, coating description, and joint type for the system, both inside and outside of the MDOT SHA right-of-way, shall be included on or with the utility plans. Maximum expected system operating pressure shall also be stated.
5. A combination of factory applied coating(s) with related field measures, as required, protecting the pipe surfaces during shipping, installation, and use shall be required for all ferrous pipes.
6. A cathodic protection system shall be required for all ferrous pipes.
   a) Voltage or current measuring terminals, when necessary, shall be close to the right-of-way line or outside of the right-of-way line in areas of controlled access rights-of-way.
7. Pipes crossing the highway rights-of-way shall be installed via a trenchless method unless specifically approved, in writing, by the appropriate District Engineer or their approved designee.
   a) Refer to Section 4.06 - TRENCHLESS TECHNOLOGY for further guidance.
8. Field welds shall be made and inspected in accordance with PHMSA Standards CFR Title 49, Part 192, Subpart E.
9. All joints shall be protected and electrically insulated from the surrounding soil in a manner at least equivalent to the protection and insulation given to the pipe proper.
10. When crossing a highway without sleeving, the pipe and installation shall comply with Section 6.08.01 – ALTERNATE TO SLEEVING.

2.02 PLANS

Virtually all utility activity performed within the MDOT SHA right-of-way, with the exception of minor/routine work performed under Blanket Permits, requires Utility Companies to submit plans to the MDOT SHA. Whether adjusting or installing facilities; performing coordination or relocation of utilities; or including utility work in an MDOT SHA construction project, plans are required.

In addition, the MDOT SHA is continuing to increase the utilization of technology in its processes. As such, the submission of electronic copies of plans will be required in addition to the hard copies, in the various accommodation, coordination, and relocation processes as determined by the MDOT SHA.

2.02.01 General Plan Development Requirements

A) Plans submitted to the MDOT SHA shall be as follows:

1. All plans shall be referenced to NAD 83/91 and NAVD 88.
2. Plans shall be of the same MDOT SHA orientation; no reversed tracings or rotated views.

3. Scale will be 1"=30' except where additional detail is required as determined by the MDOT SHA.
4. Schematic plans shall not be accepted except as supplements to conventional plans.
5. All plans shall include plan information required by all other chapters and sections of this Utility Manual including, but not limited to CHAPTER 5: ENVIRONMENTAL; CHAPTER 9 - BRIDGES AND OTHER STRUCTURES; CHAPTER 10: SIGNALS, SIGNS, AND OTHER TRAFFIC STRUCTURES.

B) All plans submitted for review shall, as a minimum, include the following:

1. State Route number and milepoint – Refer to MDOT SHA's Highway Location Reference for milepoint information.
2. Existing topography with highway features*, i.e., edge of pavement, shoulder lines, piers, ditch lines, etc.;*
3. Highway control baseline and stations;
4. North arrow, scale, latitude and longitude;
5. Existing highway right-of-way, including any controlled access areas;
6. Environmental features and controls;
7. Existing and proposed utilities must be shown accurately with details relative to the facility such as clearances, operating pressures, voltage, current, flammability, freeze point temperature, directions of flow, wall thickness, coated and wrapped lines, anode beds, yield strength, design factor, or class location, etc.,
8. Symbols used to represent existing or proposed facilities; (Clearly explain the symbols using legends or notations.)
9. Dimensions showing length of encasement, type of material, length of conductor, extent of trenching or boring, depth of facility/minimum cover, etc.;
10. Enough information to clearly illustrate how the utility is to be installed.
11. Utility location data shall be georeferenced with GPS coordinates of the beginning and end of the facility installation.
12. Other pertinent information.

2.02.02 Plans for Aerial or Surface Installations

In addition to general plan requirements, utilities proposing aerial installations or installing facilities protruding above the ground surface shall include the following plan information:

A) When applicable, plans shall include clearance dimensioning to verify compliance with MDOT SHA's ADA Policy. Refer to Section 2.06 - ADA (AMERICANS WITH DISABILITIES ACT) REQUIREMENTS for further guidance.

B) When applicable, plans shall include sufficient information to verify compliance with MDOT SHA's Clear Zone requirements. Refer to Section 2.01.04 - Clear Zones for further guidance.

C) When applicable, plans shall include sufficient information to verify compliance with MDOT SHA's Scenic Enhancement requirements. Refer to Section 2.05 - Scenic Enhancement for further guidance.

2.02.03 Plans for Underground Installations

In addition to general plan requirements, utilities proposing underground installations shall include the following plan information:

A) Elevation profile of the proposed utility location with references identifying highway features.

B) Cross sections showing the horizontal and vertical relationship between the proposed installation and any highway features and/or other existing utilities.

2.02.04 Utility Color Identification for Plans

In addition to symbols on plans to identify existing and proposed utilities, Utility Companies, as determined by the MDOT SHA, shall represent their respective facilities on plans by using industry standard color coding facilities to better facilitate a more accurate review of utility plans. See Figure 2.02.04 – Standard Utility Color Identification, for examples of color codes to be used.

Color	*Utility Represented*
RED	*Electrical Power*
YELLOW	*Gas, Oil Steam, Petroleum, or Gaseous Materials*
ORANGE	*Communication, CATV, Alarm, or Signal*
BLUE	*Potable Water*
PURPLE	*Reclaimed Water, Irrigation, or Slurry*
GREEN	*Sewer and Storm Drain*

Figure 2.02.04 – Standard Utility Color Identification

2.02.05 Electronic Utility Plans

The MDOT SHA, at its discretion, will require electronic (or georeferenced) copies of plans, in addition to the hard copies. Electronic plan copies submitted to the MDOT SHA shall be as follows:

A) Electronic plans shall comply with all other requirements of this Section 2.02 PLANS.

B) Electronic plans shall be delivered on CD-R or DVD media compatible MDOT SHA computer systems unless otherwise requested by the MDOT SHA. *i.e. electronic transmission*

C) Electronic plans shall be in 3D.dgn or MicroStation compatible format. Files should not be spanned over more than one disk.

D) In an effort to assist utilities in providing electronic plans, the MDOT SHA has provided additional information on MDOT SHA's CADD standards on the internet website: https://www.roads.maryland.gov/mdotsha/pages/index.aspx?PageId=29

2.02.06 Utility Plan Submittals

All plans submitted to the MDOT SHA for review shall be submitted to the appropriate District Utility Engineer unless specifically requested otherwise by the MDOT SHA. This will be determined on a case by case basis. In addition to compliance for plan development in this Section 2.02 PLANS, the Utility Companies shall comply with the submittal requirements of said plans for the various processes, as generally identified, as follows:

2.02.06.01 Utility Permit Plans

A) Plans should be based on the MDOT SHA construction or as-built plans. MDOT SHA construction or as-built plans may be obtained by submitting a "Construction/As-Built Roadway Plan Research Request" form from MDOT SHA's website: https://www.roads.maryland.gov/mdotsha/pages/index.aspx?PageId=783&d=116 .

B) Three sets of full-sized hard copy plans shall be submitted for permits.

1. One half-sized hard copy may be substituted for one of the full sized plans as determined by or at the request of the appropriate District Engineer or their approved designee.

C) Plans shall be color coded as per Section 2.02.04 - Utility Color Identification for Plans as determined by or at the request of the appropriate District Engineer or their approved designee.

D) One electronic set of plans shall be submitted as per Section 2.02.05 - Electronic Utility Plans as determined by or at the request of the appropriate District Engineer or their approved designee.

2.02.06.02 Utility Concept Plans

A) Plans shall be based on MDOT SHA project plans.

B) Plans shall include:

1. Proposed highway features in addition to the existing highway features. *i.e., edge of pavement, shoulder lines, piers, ditch lines, storm drains, storm water management, etc.*

2. Any proposed right-of-way needed to accommodate utility relocations.

C) Five sets of full-sized hard copy plans shall be submitted for review.

D) Plans shall be color coded as per Section 2.02.04 - Utility Color Identification for Plans as determined by the MDOT SHA.

E) One electronic set of plans shall be submitted as per Section 2.02.05 - Electronic Utility Plans as determined by the MDOT SHA.

2.02.06.03 Utility Relocation PS&E Plans

A) Plans shall be based on MDOT SHA project plans.

B) Plans shall include:

1. Proposed highway features in addition to the existing highway features. *i.e., edge of pavement, shoulder lines, piers, ditch lines, storm drains, storm water management, etc.*

2. Any proposed right-of-way needed to accommodate utility relocations.

3. Major material items;

4. Enough information about the existing and proposed installation to determine any betterment in the proposed facility, such as types and quantities of materials, strength classifications, conductor sizes, number of cable pairs, protective devices upon existing and proposed lines, etc.;

C) Six sets of full-sized hard copy plans shall be submitted for review.

D) Plans shall be color coded as per Section 2.02.04 - Utility Color Identification for Plans as determined by the MDOT SHA.

E) One electronic set of plans shall be submitted as per Section 2.02.05 - Electronic Utility Plans as determined by the MDOT SHA.

2.02.06.04 Utility 3rd Party Work Plans

A) Plans shall be based on MDOT SHA project plans.

B) Plans shall include;

1. Proposed highway features in addition to the existing highway features. *i.e., edge of pavement, shoulder lines, piers, ditch lines, storm drains, storm water management, etc.*

2. Major material items;

3. Enough information about the existing and proposed installation to determine any betterment in the proposed facility, such as types and quantities of materials, strength classifications, conductor sizes, number of cable pairs, protective devices upon existing and proposed lines, etc.;

C) Five sets of full-sized hard copy plans shall be submitted for review.

D) Plans shall be color coded as per Section 2.02.04 - Utility Color Identification for Plans as determined by the MDOT SHA.

E) One electronic set of plans shall be submitted as per Section 2.02.05 - Electronic Utility Plans as determined by the MDOT SHA.

2.02.06.05 Utility As-Built Plans

A) As-built plans shall meet all the specifications in this Section 2.02 PLANS.

B) Unless major changes require plan revisions, the as-built plans may consist simply of original hard copy plans marked in red.

C) If changes are incorporated into plan revisions, new hard copies shall be provided to the MDOT SHA with the changes marked in red.

1. One electronic set of as-built plans shall be submitted as per Section 2.02.05 - Electronic Utility Plans as determined by the MDOT SHA.

D) As built plans for relocations showing exact installation locations will be delivered to the MDOT SHA within sixty (60) days after installation or at the time of final billing.

2.03 AGREEMENTS

23 CFR 645.113 states in part, "On Federal-aid and direct Federal projects involving utility relocations, the utility and the TD shall agree in writing on their separate responsibilities for financing and accomplishing the relocation work." As such, the MDOT SHA is required to have agreements with utilities for utility relocations on Federal-aid and direct Federal highway projects.

The MDOT SHA routinely enters into a variety of third-party agreements and Memoranda of Understanding with other state agencies, local governments, municipalities, utilities, and private enterprises that benefit the traveling public by utilizing a combination of real estate, funding, and actual highway improvements on the State's highway system. The type of agreement will determine who from the MDOT SHA shall be the initial point of contact for the Utility. The Utility shall work through the appropriate initial point of contact unless otherwise directed by the MDOT SHA.

2.03.01 Utility Master Agreements

Utility Master Agreements are high-level agreements between the MDOT SHA and Utility Companies that sets forth general principles to facilitate cooperation and coordination processes and the intent of both parties to work cooperatively. Master agreements generally describe each parties' responsibilities for financing and accomplishing relocation and adjustment work encountered on an areawide or statewide basis. This type of agreement includes items such as standards, specifications, and general procedures for resolving conflicts. See the MDOT SHA's Utility Center Webpage for the Utility Master Agreement Template. The Statewide Utility Engineer shall be the Utility's point of contact for Utility Master Agreements. Utility Master Agreements are signed by the parties at the executive director's level.

2.03.02 Contract Assignment Form (UC-5)

Contract Assignment Forms (UC-5) are an extension of the master agreements at a project level basis and as such, are MDOT SHA's version of a multilevel agreement. The Contract Assignment form is used when the Utility Company is performing the relocation and adjustment work for an MDOT SHA project and contains project-level details and specific provisions such as project cost responsibility, Buy America compliance, etc. Supporting documents such as plans, specifications, and estimates are attached with the UC-5 form. The appropriate DUE shall be the Utility's initial point of contact for Contract Assignment Forms (UC-5). The UC-5 form is part of the Utility Relocation PS&E package. See Section 7.07.02 - Utility Relocation Plans, Specifications, & Estimate Package and Section 7.07.02.04 - Utility Relocation Agreements for additional information. The Contract Assignment Form (UC-5) is signed by officers who are authorized to bind the Utility Company and the appropriate MDOT SHA District Engineer.

2.03.03 Utility 3rd Party Work Agreements

Utility 3rd Party Work Agreements are used when the utility relocation and adjustment work is incorporated into an MDOT SHA project. Utility 3rd Party Work Agreements are formal documents consisting of all essential terms and conditions to include the utility work into MDOT SHA's project and contains project-level details and specific provisions such as financial responsibility, project changes, progress and final billing, etc. The appropriate District Utility Engineer shall be the Utility's initial point of contact, although the Office of Regional and Intermodal Planning's Agreements Team will develop the agreement. Utility 3rd Party Work Agreements are signed by officers who are authorized to bind the MDOT SHA and the Utility Company. See Section 7.09.03 - Utility 3rd Party Work Plans, Special Provisions, & Estimate Package and Section 7.09.03.04 - Utility 3rd Party Work Agreements for additional information.

2.03.04 Letter Exchange Agreements

Letter Exchange Agreements generally consist of an exchange of correspondence that sets forth all essential terms and conditions, and bears endorsements of both the MDOT SHA and the Utility Company. Letter Exchange Agreements are generally used when a Utility Master Agreement does

not exist between the MDOT SHA and the Utility Company. While Letter Exchange Agreements are minimally acceptable to meet FHWA requirements for federal funding, this is MDOT SHA's least preferred type of agreement. The appropriate District Utility Engineer shall be the Utility's initial point of contact for Letter Exchange Agreements. Letter Exchange Agreements are part of the Utility Relocation PS&E process. See Section 7.07.02 - Utility Relocation Plans, Specifications, & Estimate Package and Section 7.07.02.04 - Utility Relocation Agreements for additional information.

2.03.05 Memoranda of Understanding (MOU)

Memoranda of Understanding are similar to Utility 3rd Party Work Agreements, except MOU's are generally executed between the MDOT SHA and another governmental entity. Memoranda of Understanding are used when local government or municipal utility relocation and adjustment work is incorporated into an MDOT SHA project. MOU's are formal documents consisting of all essential terms and conditions to include the utility work and contains project-level details and specific provisions such as financial responsibility, project changes, progress and final billing, etc. The appropriate District Utility Engineer or the Project Manager may be the Utility's initial point of contact, although the Office of Regional and Intermodal Planning's Agreements Team will develop the MOU. MOU's are signed by officers who are authorized to bind the MDOT SHA and the local government or municipality. See Section 7.09.03 - Utility 3rd Party Work Plans, Special Provisions, & Estimate Package and Section 7.09.03.04 - Utility 3rd Party Work Agreements for additional information.

2.03.06 Utility Permits

Utility Permits, in the strictest sense, are similar to Letter Exchange Agreements in which there is an exchange of correspondence (the permit application and the permit itself) establishing all essential terms and conditions for the utility to install its facilities. While a Utility Permit may not be perceived as an agreement, Utility Permits specifically state that all future adjustments of the facilities covered under the permit shall be at the sole expense of the Utility Company. Utility Permits are unique in the respect that they are required under §8-646 of the Annotated Code of Maryland. Utility Permits are issued through the appropriate district office. The appropriate District Utility Engineer shall be the Utility's initial point of contact for Utility Permits. Refer to CHAPTER 3: PERMITS for further guidance.

2.03.07 Resource Sharing Agreements

Resource Sharing Agreements (RSA's) are used when the MDOT SHA allows telecommunication companies to place telecom facilities within SHA's right of ways or on SHA property in exchange for compensation, equipment, and/or services. RSA's are formal documents consisting of all essential terms and conditions similar to Project Agreements and contains project-level details and specific provisions such as compensation terms and conditions, project requirements, contractual provisions, etc. RSA's may be signed by persons with signatory authority. RSA's are unique in the respect that certain RSA's require the Board of Public Works approval before they can become effective. RSA's are regulated under §3A-307(c) of Division 1 of the State Finance and Procurement Article of the Annotated Code of Maryland. MDOT TSO Resource Sharing Administrator; MDOT SHA's Office of CHART & ITS Development's ITS Division; and MDOT SHA's Office of Construction – Utilities Section coordinate the development and implementation of Resource Sharing Agreements for the MDOT SHA. The Utility's initial point of contact may be a person(s) from any of these areas. See Section 6.03.07 - Resource Sharing and Section 6.03.07.04 - Resource Sharing Agreements for additional information.

2.04 RIGHT-OF-WAY

2.04.01 Uniform Act Requirements

A) In accordance with 23 CFR 645.107(j), Federal funds may participate in the costs of replacement right-of-way for utilities.

B) Either a State or a utility may purchase replacement right-of-way for utility relocations.

- If a State or a political subdivision of a State acquires replacement right-of-way, the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act) apply.
- If a utility acquires replacement right-of-way, the requirements of the Uniform Act do not apply. This has been the FHWA's longstanding position.

2.04.02 Replacement Right-Of-Way

A) In certain cases, Federal-aid funds may be used to acquire replacement right-of-way for a utility where the existing utility facilities are located within public right-of-way and the utility has no property interests in its existing location.

B) 23 CFR 645.111(a)(1) states that Federal participation may be approved for the cost of replacement right-of-way when an acquisition of right-of-way:

- is made in the interest of project economy, or
- is necessary to meet the requirements of the highway project.

C) Thus, when a State or locality routinely dedicates or permits a portion of the road and street right-of-way for use by utilities in accordance with established standard criteria pursuant to State law, ordinance, or administrative practice, such right-of-way may be considered eligible for Federal-aid reimbursement as an integral part of the project right-of-way.

2.04.03 Right-Of-Way Needs And Utility Use

A) The FHWA's authority for allowing utility use and occupancy of the right-of-way of Federal-aid and direct Federal highway projects is contained in 23 CFR 1.23. Under the provisions of this section, the State must acquire right-of-way that is adequate not only for the construction of the highway facility but also for its operation and maintenance.

B) The right-of-way must be devoted exclusively to public transportation purposes. However, 23 CFR 1.23(c) permits certain non-highway uses of the right-of-way which are found to be in the public interest provided such uses do not impair the highway or interfere with the free and safe flow of traffic thereon.

C) A direct relationship exists between the 23 CFR 1.23 requirements concerning the adequacy of right-of-way to be acquired and the provisions for permitted non-highway uses. Proposed non-highway uses cannot be of a nature that would negate the general requirement regarding the adequacy of the right-of-way. Therefore, it is implicit in the public interest finding for utility use of the right-of-way of Federal-aid or direct Federal highway projects that there must be adequate space available to locate the utility facilities in a manner that does not interfere with the safe and efficient operations of the highway.

D) Consequently, when a State intends to permit utilities to use and occupy public highway right-of-way, such potential use should be a consideration in determining the extent and adequacy of the right-of-way needed for the project. Failure to recognize the impact of such use, as well as other uses on private property located adjacent to the public highway right-of-way may affect the safe and efficient operations of the highway and may result in the acquisition of right-of-way which is inadequate to meet the needs of the highway and the traveling public. For example, little would be gained by acquiring restricted right-of-way and denying its use to certain utilities if these utilities could locate their facilities on private property adjacent to the restricted right-of-way with substantially the same impact on the highway and its users.

E) Therefore, the issue of adequate accommodation of utilities is a legitimate consideration in the development of highway projects. This is particularly true of land service facilities where the highway user and utility consumer tend to be one and the same.

F) The concept of considering potential utility uses in the determination of right-of-way needs has been incorporated in 23 CFR 645.209(a). A corresponding issue then becomes the use of Federal-aid highway funds for the acquisition costs of the needed right-of-way.

G) Utility use of highway right-of-way is not considered to be a use for a transportation purpose.

- **i.** Therefore, Federal-aid highway funds are typically not eligible to participate in right-of-way acquired solely for the purpose of accommodating utility facilities in excess of that normally acquired in accordance with standard criteria and procedures.
- **ii.** However, if the MDOT SHA determines that such right-of-way is an integral part of the project right-of-way, such right-of-way *may be*, but not necessarily, considered eligible for Federal-aid reimbursement.

2.04.04 Determining Utility Right-of-Way and/or Easement Needs

The determination as to the need for right-of-way and/or easement for utilities will be made as follows:

A) The MDOT SHA will determine what right-of-way and/or easement is required for construction of MDOT SHA's project. This typically provides adequate right-of-way to accommodate the existing and typical utility facilities that will be relocated.

B) If there is insufficient space for the utility within the MDOT SHA right-of-way or easement determined, or which is to be acquired, for the construction of the project, the DUE will coordinate with each Utility for any requests of any additional right-of-way and/or easements necessary for their facilities. The Utility shall provide a written statement to the MDOT SHA detailing what additional right-of-way and/or easements are needed to accommodate the Utility's facilities.

C) The DUE, the Utility and the Project Manger along with the members of the Project Development Team as needed, will meet to: review the specific parcels of additional right-of-way and/or easements needed by the Utility; determine which parcels and/or easements are to be acquired by the MDOT SHA or the Utility; and determine the priority in which the parcels and/or easements need to be acquired. The Project Manager should prepare a written summary of this meeting documenting each party's responsibility and send copies to each member of the Project Development Team.

2.04.05 Acquiring Utility Right-of-Way and/or Easements

A) Utility Acquisition

1. If the Utility is to acquire its own right-of-way and/or easements, the Utility shall provide the DUE with an estimated timeline of their proposed acquisitions. Additionally, it shall be the Utility's responsibility to provide the MDOT SHA with periodic (preferably monthly) status reports of the Utility's right-of-way and/or easement acquisitions. The DUE will forward to the Project Manager and the District Right-of-Way Office. These reports are critical to ensure that the Utility can coordinate the acquisition of their required right-of-way or easements with the MDOT SHA or soon after the MDOT SHA has completed its negotiations with each affected property owner. It is desirable that right-of-way and easements for utilities be acquired concurrently with acquisition of right-of-way for the highway project.

2. If the Utility is entitled to reimbursement for the cost of acquisition of the replacement right-of-way or easements, the Utility shall show the estimated cost of these acquisitions on the UC-4 Form Cost Estimate in its Utility Relocation PS&E Package. The Utility shall provide documentation of the actual costs for acquiring the necessary utility right-of-way or easements on the UC-12 Form Summary of Billing in its Final Bill Package.

B) MDOT SHA Acquisition

1. If the MDOT SHA is to acquire right-of-way and/or easements for the Utility, the MDOT SHA may do so in accordance with the Annotated Code of Maryland Real Property Article and § 8 subtitle 3 Acquisition and Disposition of Property of the Transportation Articles. As such, the MDOT SHA will need to justify the "need of the property for a public purpose." See § 8-302 General power to acquire private property for additional information. The Utility shall provide to the MDOT SHA any documentation necessary to support this justification for the State Roads Commission, Board of Property Review, and/or the Board of Public Works.

2. Transfer of Acquired Property Interest

a) In keeping with MDOT SHA's practice to "make the utility whole" to the extent that existed prior to MDOT SHA's construction, any transfers of property interests acquired by the MDOT SHA shall be based on prior rights determinations and in accordance with the Annotated Code of Maryland Real Property Article and § 8 subtitle 3 Acquisition and Disposition of Property of the Transportation Article.

b) If the Utility is entitled to the replacement of right-of-way or easements, the MDOT SHA may transfer the property interests of any right-of-way and/or easements acquired by the MDOT SHA for the Utility based on prior rights to the extent that existed prior to MDOT SHA's construction and in accordance with the Annotated Code of Maryland Real Property Article and § 8 subtitle 3 Acquisition and Disposition of Property of the Transportation Article.

c) If the Utility is not entitled to the replacement of right-of-way or easements, the MDOT SHA is under no obligation to transfer the property interests of any right-of-way and/or easements acquired by the MDOT SHA. However, the MDOT SHA may at its sole

discretion allow the Utility purchase the right-of-way or easements if the right-of-way or easement is not needed for any other public purpose and is done in accordance with the Annotated Code of Maryland Real Property Article and § 8 subtitle 3 Acquisition and Disposition of Property of the Transportation Article.

2.04.06 Public Utility Easements (PUE's)

A) PUE's are easements obtained by a Local Public Agency (LPA) when property is platted or re-platted for development. Easements are reserved to accommodate utility access to the development. This easement is intended for use of all utilities, and therefore provides a permissive right to any utility to place facilities within the easement. However, PUE's do not convey a property interest to any of the occupants of the PUE.

B) The Public Utility Easement issue has arisen repeatedly. Some utilities believe they should be allowed to retain their prior rights on highway projects where the Utility is in a PUE. This is analogous to a utility being a "displaced person" under the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (the "Act").

C) In 1983, prior to passage of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (STURAA), this issue was elevated to the U.S. Supreme Court in Norfolk Redev. Auth. v. C&P Tel. Co., 464 U.S. 30 (1983) a case involving relocation of a utility from a public right-of-way on a federally funded urban renewal project. The Court held that the utility was not a "displaced person" within the meaning of the Act and was not entitled to compensation under the provisions of the Act. The reasoning was that the Act did not change the long-established common law principle that a utility forced to relocate from a public right-of-way must do so at its own expense.

D) Refer to Section 7.03.02 - Public Utility Easements for further Guidance

2.04.07 Aerial Easements

A) An easement is defined as the right to use another person's land for a stated purpose. It can involve a general or specific portion of the property. With regards to an aerial easement, the area above the land would be referred to as the aerial easement area. Aerial easements are designed to maintain a safe distance from utility lines, (particularly electric lines) which will move from side to side when the wind blows. In addition, aerial easements give the right to Utility Companies to maintain the area around their lines which includes trimming trees.

B) Aerial Easement issues frequently arise on MDOT SHA projects involving the relocation of utility pole lines. Many times, the utilities request the MDOT SHA to identify aerial easements on highway projects. The MDOT will identify aerial easements if the Utility can provide documentation that it has an easement granted specifically to that Utility Company, which can be considered a recorded property right. This is in keeping with MDOT SHA's practice to "make the utility whole" to the extent that existed prior to MDOT SHA's construction.

2.05 SCENIC ENHANCEMENT

A) The type and size of utility facilities and the manner and extent to which they are permitted along or within highway rights-of-way can materially alter the scenic quality of highway roadsides and adjacent areas. Additional controls are applicable in certain areas that have been acquired or set aside for their scenic quality. Such areas include scenic strips, overlooks, rest

areas, recreation areas, the right-of-way of highways adjacent thereto, and the right-of-way of sections of highways which pass through public parks and historic sites.

B) New underground utility installations may be permitted within such lands where they do not require extensive removal or trimming of trees or other natural features visible to the highway user or do not impair the visual quality of the land being traversed.

C) New aerial installations shall be avoided at such locations.

D) See Section 5.05.03 - Scenic Byways and Trails for additional information.

2.06 ADA (AMERICANS WITH DISABILITIES ACT) REQUIREMENTS

Both Maryland and Federal law require that new construction and reconstruction of any public facilities be done in a manner that ensures the facility is accessible by all users, including those with disabilities.

A) Any work performed within the MDOT SHA rights-of-way which includes construction or reconstruction of curbs, curb ramps, sidewalk /pedestrian walkways, crosswalks, or installation of modification of any type of obstructions contained within a sidewalk or pedestrian walkway, be built in accordance with the MDOT SHA's Accessibility Policy & Guidelines for Pedestrian Facilities along State Highways. See MDOT SHA's Internet Site https://www.roads.maryland.gov/ohd/adafinal.pdf for further guidance.

B) These requirements include providing a minimum 60 inch width path of travel, clear of obstructions within or protruding into the sidewalk/pedestrian walkway.

C) If an object within the limits of the construction already exists within the sidewalk/pedestrian walkway, every reasonable effort should be made to relocate the object as part of the work performed.

D) If an object cannot be placed or relocated entirely outside of the sidewalk/pedestrian walkway, then the object should be placed or relocated in manner that provides the maximum possible clear width, which in no case shall be less than 36 inches.

E) Any work performed shall in no way reduce or negatively impact the accessibility of the curb ramps, sidewalk /pedestrian walkway, crosswalks, etc. from what existed prior to construction.

2.07 EXCEPTIONS

A) Many of the sections of this Utility Manual require approvals from other MDOT SHA offices (OOS, OOTS, HDD, etc.) prior to the MDOT SHA approving certain utility work within MDOT SHA rights-of-way. This is MDOT SHA's process to ensure thorough reviews by the appropriate offices and is NOT considered an exception to this Utility Manual.

B) An exception is a proposed utility installation that is contrary to this Utility Manual and requires the approval of MDOT SHA's Deputy Administrator/Chief Engineer for Operations. This includes, but is not limited to, exceptions on Federal-aid projects, controlled access rights-of-way, and/or on highways in the National Highway System within Maryland.

1. Exceptions on highways in the Interstate Highway System within Maryland will require FHWA's concurrence in addition to the MDOT SHA's Deputy Administrator/Chief Engineer for Operations approval.
2. Exceptions on Federal-aid projects may, as determined by FHWA, require FHWA concurrence.

3. Minor exceptions to accommodate utilities on **Non-Controlled Access Roadways**, may be approved by the appropriate District Engineer provided it is determined that the levels of service and safety intended for the section of highway are not unreasonably compromised. For example, in urban areas, where adequate right-of-way does not exist outside the traveled roadway or sidewalk so as to reasonably, as determined by the MDOT SHA, accommodate utility facilities.

4. At the sole discretion of the appropriate District Engineer, the District may require the Utility to submit a request for exception to this Utility Manual for review and approval by the MDOT SHA's Deputy Administrator/Chief Engineer for Operations for any situation, proposed installation, modification, or request by the Utility.

C) By definition, exceptions have the potential to negatively affect the continued operation of the highway. Therefore, exception requests and their impact on highway facilities both during construction and on future operations will be highly scrutinized by the MDOT SHA. As such Utilities should carefully examine all other options before considering a request for an exception from the MDOT SHA.

D) Compliance with the exception requirements of this Section 2.07 - EXCEPTIONS does not constitute automatic approval for said exception.

2.07.01 Exception Request Submittals

A) All exceptions to this Utility Manual require written justification from the utility for review and appropriate approval. The approval of any exception request must meet four criteria. The utility owner or its representative must provide sufficient information to prove that the proposed exception is: Reasonable, Valid, Verified, and Justified.

B) The exception request must be **reasonable** and within the parameters of normal industry standards. There must be a **valid** reason the exception is necessary, and it should not place the convenience of the utility ahead of the requirements of the MDOT SHA. Issues or circumstances cited as reasons for the exception must be **verified** by documentation. The proposed exception must also be **justified** as the only viable means of installing the proposed utility based on all other alternatives considered but rejected.

C) Requests shall be considered incomplete until enough information is received to allow for a meaningful review.

D) Generalized, vague, or incomplete information will delay the review process and could potentially result in MDOT SHA's rejection of the request.

E) MDOT SHA may deny exception requests that are insufficiently justified.

F) All Exception Request Submittals shall include the following documentation:

1. A complete explanation of the circumstances creating the need for the proposed exception.

2. A detailed breakdown (Labor-Equipment-Material) of estimated costs for each alternate to install the proposed utility; and all reasons (with sufficient specificity and supporting detailed explanations for each reason) why none are feasible.

   a) The fact that the Utility's other alternatives are not as cost effective as the requested utility exception will not necessarily be determinative of whether the Utility would suffer an unreasonable hardship without the Utility Manual exception.

3. Verification that the accommodation will not adversely affect highway users and safety operations.
4. Verification that the accommodation will not adversely affect the design, construction, and maintenance of the highway.
5. Verification that the accommodation meets the MDOT SHA requirements for access for constructing and servicing the proposed facilities.
6. Verification of compliance with all other requirements for the proposed accommodation.
7. Engineering plans, profiles, cross sections, and details for the chosen route as per Section 2.02 - PLANS.
8. Any additional supporting information.

G) The Utility Manual Exception Request Process will be as follows:

1. Requests for an exception to the Utility Manual shall be filed through the appropriate District Engineer.
2. Upon review of the Utility Manual Exception Request and IF the appropriate District Engineer concurs with the proposed exception, the appropriate District Engineer will:
   - **a)** Submit a request for approval of the proposed exception to MDOT SHA's Deputy Administrator/Chief Engineer for Operations **THROUGH** MDOT SHA's Statewide Utility Engineer; or
   - **b)** Approve the Utility Manual Exception Request via the Complete Authorized Utility Permit provided the proposed exception is on a Non-Controlled Access Roadway and meets the criteria in Section 2.07 - EXCEPTIONS, Subsection (B) 3.
3. MDOT SHA's Statewide Engineer's Section will review and request concurrence from FHWA if necessary.
   - **a)** Any Utility Manual Exception Requests sent directly from the Utility to MDOT SHA's Statewide Utility Engineer's Section will be returned for submittal to the appropriate District Engineer.
4. MDOT SHA's Statewide Utility Engineer's Section will prepare and submit the completed package (with FHWA's concurrence if required) recommending approval or denial to MDOT SHA's Deputy Administrator/Chief Engineer for Operations.

CHAPTER 3

UTILITY PERMITS

3.01 GENERAL

A) The MDOT SHA establishes the requirements and controls for the issuance of utility permits. This utility permit process ensures uniform policies and standards for accommodating utility facilities within the right-of-way and provides a basis for the planning of utility installations. MDOT SHA's utility permit process makes known the intent of companies, local governments, and municipalities to carry out work within the MDOT SHA right-of-way; stipulates the nature and extent of such work; provides an administrative means to coordinate the use of MDOT SHA's right-of-way; to hold the Permittee responsible for such authorized work; provide a means to grant approval for the authorized work; and establish records of all utility facility installations, certain maintenance activities, and operations within the MDOT SHA right-of-way.

B) Before installing, constructing, removing, relocating, replacing, adjusting and/or maintaining any utility facilities that occupies or encroaches or will occupy or encroach on the Maryland State Highway System, the Permittee shall be required to obtain written authorization from the MDOT SHA. Companies, local governments, and municipalities shall not perform any work within MDOT SHA right-of-way without a Complete Authorized Utility Permit for each location as per § 8-646 of the Transportation Articles of the Annotated Code of Maryland.

C) The installation of private utilities is strictly prohibited unless the facilities are installed and maintained by an Authorized Public Utility, local government or municipality.

D) The MDOT SHA will issue Utility Permits to only those companies, local governments, and municipalities that have been approved by the MDOT SHA as an Authorized Public Utility.

1. See Section 3.02 - AUTHORIZED PUBLIC UTILITIES for further guidance.

E) The MDOT SHA issues Utility Permits in two (2) parts which when combined comprise a Complete Authorized Utility Permit. (hereinafter referred to Complete Authorized Utility Permit)

1. **Part 1: Utility Permit General Provisions**
   - **a)** The Permittee shall download the Utility Permit General Provisions from MDOT SHA's internet web site: https://www.roads.maryland.gov/mdotsha/pages/index.aspx?PageId=870 .
   - **b)** See Section 3.03 - UTILITY PERMIT GENERAL PROVISIONS for further guidance.
2. **Part 2: Individual Work Order Permits**
   - **a)** Individual Work Order Permits are issued by the appropriate district office under the signature of appropriate District Engineer or their approved designee.
   - **b)** See Section 3.04 - INDIVIDUAL WORK ORDER PERMITS for further guidance.
3. The Permittee shall attach both parts of the Utility Permit together in order to constitute a Complete Authorized Utility Permit prior to beginning any work within MDOT SHA rights-of-way.
4. Individual Work Order Permits alone or the Utility Permit General Provisions alone DOES NOT grant permission to the Permittee to work within MDOT SHA rights-of-way.

5. Only a Complete Authorized Utility Permit grants permission to the Permittee access to SHA right-of-way to perform the Permittee's work in accordance with and as defined in the Complete Authorized Utility Permit.

F) The Permittee shall perform all work in accordance with all provisions of the Complete Authorized Utility Permit.

1. The Permittee shall be responsible for the relocation and/or adjustment of any private facility and/or any other public utility necessitated by or in connection with the Complete Authorized Utility Permit.
2. The Permittee shall immediately report any significant deviation from the plans submitted to the appropriate MDOT SHA District Utility Engineer's Office.
   a) The Permittee shall submit a revised plan showing changes to the appropriate MDOT SHA District Utility Engineer in accordance with TC-4.01 – Working Drawings for approval prior to performance of work.
3. Attachments to bridges and other structures are strictly prohibited unless specifically authorized in the Individual Work Order Permit.
4. Open cutting of any paved surface is strictly prohibited unless specifically authorized in the Individual Work Order Permit.

G) The Permittee shall contact all offices and persons prior to the start of utility work, in accordance with the Complete Authorized Utility Permit - Notifications requirements.

H) The MDOT SHA may modify any Complete Authorized Utility Permit, or permit provision at any time in the event of a safety concern, differing site conditions, design errors or omissions, restoration concerns, changes in laws, regulations or requirements, or any other unforeseen changes or issue which might affect any permit or permit provision.

1. The Permittee will first be provided the opportunity to demonstrate its compliance with the permit or address the modification before any permit, or permit provision, is modified.

I) The MDOT SHA may stipulate modifications to the approved construction plans whenever necessary.

1. The MDOT SHA will notify the Permittee of any modifications, required by the MDOT SHA, to the approved construction plans prior to performance of the work.
2. The permittee shall be entirely responsible for all additional costs and expenses associated with these changes.

J) The MDOT SHA may revoke any Complete Authorized Utility Permit in the event that the Permittee fails to cure its non-compliance with any condition of the permit.

1. In the event the Permittee's fails to comply with the terms of a Complete Authorized Utility Permit, the MDOT SHA will notify the Permittee of its non-compliance.
2. The Permittee will then be provided the opportunity to cure its non-compliance before any permit, or permit provision, is modified or revoked.

K) Complete Authorized Utility Permits are not assignable.

1. The use of any Complete Authorized Utility Permit by any party not specifically identified on the Individual Work Order Utility Permit part of the Complete Authorized Utility Permit shall constitute the immediate revocation of the permit.

2. Contractors and subcontractors authorized by the Permittee are authorized to carry out the work allowed under a Complete Authorized Utility Permit on behalf of the Permittee.

L) A copy of the Complete Authorized Utility Permit shall be available at the job site at all times.

1. A copy of the Work Zone Traffic Control Plan approved by MDOT SHA shall be attached to the Complete Authorized Utility Permit at all times.
2. If the Permittee's representative does not have a copy of the Complete Authorized Utility Permit on the job site and/or is not familiar with the contents of the permit, any or all of the following may result:
   - **a)** District Permit Inspectors shall have the option of shutting down the project.
   - **b)** District Permit Inspectors may request law enforcement to have Permittee workers vacate the MDOT SHA right-of-way.
   - **c)** MDOT SHA may require the Permittee to pay the MDOT SHA restoration costs when the Permittee has begun work without a Complete Authorized Utility Permit.
   - **d)** MDOT SHA may potentially suspended future Utility Permits until past non-compliance is resolved.
   - **e)** MDOT SHA may exercise all other options identified in Section 1.06 - ENFORCEMENT.

M) District Permit Inspectors will check to ensure compliance with MDOT SHA permit requirements.

1. Refer to Section 4.04 – INSPECTION for further guidance.

N) The Permittee shall obtain and provide proof of (i) any construction or other easements; (ii) right-of-Entry's; and/or (iii) any other additional permissions, necessary for the Permittee to perform the work under the Complete Authorized Utility Permit prior to performing any work on any property of abutting property owners.

1. Refer to Section 3.05 – ABUTTING PROPERTIES for further guidance.

O) The Permittee shall comply with all Federal, State, and local laws, regulations and ordinances applicable to their activities.

1. Complete Authorized Utility Permits issued by the MDOT SHA does not relieve the Permittee from compliance with any applicable Federal, State or local government regulations.
2. The Permittee shall obtain any additional permits required by other agencies.
3. The Permittee shall obtain and provide proof of any required permits prior to performing any work on or adjacent to railroad facilities or right-of-way thereof.

P) In the event future road improvements require the relocation, adjustment and/or removal of facilities installed under any Complete Authorized Utility Permit, all costs associated with the relocation, adjustment and/or removal of said facilities shall be borne by the Permittee.

1. Refer to Section 1.05.01 - Maryland Law – MDOT SHA, Subsection (C) (1) for further guidance.

3.01.01 Guidance Documents for Permits

A) All utility permits shall be in complete conformance with specifications, standards, provisions and policies of Section 1.08 - GENERAL GUIDANCE DOCUMENTS.

B) In addition to the documents referenced in the previous paragraph, design and construction associated with utility permits shall be performed in complete conformance with, and particular attention to, the following MDOT SHA publications as applicable to the type of utility facility and/or type of work:

- Book of Standards For Highway & Incidental Structures
- Standard Specifications For Construction And Materials
- Supplemental Specifications and Provisions
- SHA Environmental Guide for Access & District Permit Applicants
- MDOT SHA's Accessibility Guidelines for Pedestrian Facilities along State Highways
- Utility Permit Application
- Utility Permit Instructions
- Utility Permit General Provisions
- Traffic Control Permit Application

C) Whenever MDOT SHA's Standard Specifications For Construction And Materials is referred to in this Chapter or this Utility Manual, the latest version of the Supplemental Specifications and Provisions shall be reviewed to ensure the most current specification is used.

3.02 AUTHORIZED PUBLIC UTILITIES

Companies, local governments, and municipalities must be authorized by the MDOT SHA before the appropriate MDOT SHA district office may begin issuing permits for work performed by that Permittee within MDOT SHA rights-of-way. MDOT SHA's authorization process verifies that the Permittee is authorized to install, operate and maintain facilities in Maryland; that the Permittee is capable of maintaining and relocating its facilities as necessitated by MDOT SHA operations and projects; and that Permittee is able to respond to an emergency in a timely manner as may be required.

3.02.01 Authorization Criteria For A New Public Utility

A Company, local governments, or municipality shall meet the following criteria to be considered for approval as an authorized public utility by the MDOT SHA:

A) A Permittee shall provide documentation that it qualifies under one of the following conditions:

1. under the jurisdiction of the Maryland Public Service Commission,

2. under the jurisdiction of the Federal Communications Commission,

3. covered by the Cable Communications Policy Act of 1984 codified as 47 USC Sections 541 and 556,

4. governed by Title 9 of the Environmental Articles of the Annotated Code of Maryland

B) A Permittee shall maintain a permanent office in Maryland, manned 7 days a week, 24 hours a day.

1. The Permittee shall demonstrate the ability to respond to a highway emergency within 2 hours of notification.

2. The Permittee shall be equipped to repair, adjust, remove, or relocate any facility involved in an emergency situation.

3. The Permittee shall provide to the MDOT SHA the Permittee's 24/7 contact information.

C) The Permittee shall comply with Title 12 – Underground Facilities of the Public Utilities Articles of the Annotated Code of Maryland if the Permittee has or will have any underground facilities.

1. The Permittee shall provide documentation that it is an "owner-member" of the "One-call system" as defined and required in the above referenced Title 12 if applicable.

D) The Permittee shall provide proof of insurance in accordance with Standard Specifications For Construction And Materials, Sections GP-7.14 Liability Insurance and TC-5.01 Insurance.

1. The Maryland State Highway Administration shall be listed as a "Certificate Holder" on the "Certificate of Insurance" form.

2. Self-Insured companies may provide a self-insurance letter.

E) As of the date of this Utility Manual, the Permittee shall enter into a Utility Master Agreement with the MDOT SHA. A Utility Master Agreement Template may be found the Appendix of this Utility Manual.

F) The Permittee shall download a copy of MDOT SHA's Utility Permit General Provisions and the Utility Permit General Provisions Acknowledgement Form from MDOT SHA's web site at https://www.roads.maryland.gov/mdotsha/pages/index.aspx?PageId=870 .

1. The Permittee shall sign, date and return the Utility Permit General Provisions Acknowledgement Form acknowledging the Permittee's acceptance to agree by the Utility Permit General Provisions' terms and conditions.

3.02.02 New Public Utility Application Package Submittal

A) The Permittee shall submit a request to be recognized as an Authorized Public Utility by submitting a New Public Utility Application Package to MDOT SHA's Statewide Utility Engineer.

B) The New Public Utility Application Package shall consist of the following items:

1. A letter on the Permittee's letterhead formally requesting review and approval of the New Public Utility Application Package.

   a) This letter shall include a detailed description of the services to be provided through the facilities proposed to be constructed and maintained pursuant to an MDOT SHA utility permit.

   b) Section 3.02.01 - Authorization Criteria For A New Public Utility (B) may be addressed in this letter, otherwise the Permittee shall provide separate documentation verifying compliance with this recognition criteria requirement.

2. Documentation verifying compliance for each recognition criteria requirement of Section 3.02.01 - Authorization Criteria For A New Public Utility (A), (C), (D) & (F).

   a) Documentation verifying compliance for each recognition criteria requirement of Section 3.02.01 - Authorization Criteria For A New Public Utility (B) if not included in the formal request letter previously mentioned.

3. Two (2) originals of the Utility Master Agreement as per Section 3.02.01 - Authorization Criteria For A New Public Utility (E), signed by officer of the Permittee's Company at the executive director's level, to be signed and executed by MDOT SHA.

C) Submittals shall be considered incomplete until ALL items are received.

D) Generalized, vague, or incomplete information will delay the review process and could potentially result in MDOT SHA's rejection of the New Public Utility Application Package.

E) Upon MDOT SHA executing the Utility Master Agreement, the New Public Utility Application Package will be deemed approved and the Permittee may apply for the MDOT SHA Permits in accordance with Section 3.04 – Individual Work Order Permits.

F) After execution of the Utility Master Agreement, the appropriate MDOT SHA District(s) and the Permittee will be notified of the Permittee's approval as an Authorized Public Utility by MDOT SHA and that the appropriate MDOT SHA District(s) may begin to issue the Utility Permits to the Permittee.

3.03 UTILITY PERMIT GENERAL PROVISIONS

A) The Utility Permit General Provisions contains the general requirements, conditions, procedures and contact information required for all communication of activities performed within MDOT SHA right-of-way. Because the Utility Permit General Provisions apply to all Utility Permits, MDOT SHA provides the Utility Permit General Provisions via the internet. As such, it is the responsibility of the Permittee to obtain the Utility Permit General Provisions from MDOT SHA's website; attach the Utility Permit General Provisions to each and every Individual Work Order Permit obtained from the appropriate district office; and insure the Complete Authorized Utility Permits are at the job sites at all times.

B) The Permittee shall download the Utility Permit General Provisions and the Utility Permit General Provisions Acknowledgement Form from MDOT SHA's web site at: https://www.roads.maryland.gov/mdotsha/pages/index.aspx?PageId=870 (i) initially when the Permittee is requesting to be approved as an Authorized Public Utility; and (ii) again upon notification by the appropriate MDOT SHA district(s) that the Utility Permit General Provisions have been revised.

1. The Permittee shall (i) initially when requesting to be approved as an Authorized Public Utility; and (ii) again at each notification that the Utility Permit General Provisions have been revised; sign, date and return the Utility Permit General Provisions Acknowledgement Form acknowledging the Permittee's acceptance to agree by the Utility Permit General Provisions' terms and conditions.

C) Utility Permit General Provisions are Part 1 of obtaining a Complete Authorized Utility Permit.

1. The Permittee shall attach a copy of the Utility Permit General Provisions to each and every Individual Work Order Permit to comprise a Complete Authorized Utility Permit to allow the Permittee access to MDOT SHA rights-of-way to perform specific activities as requested by the Permittee.
2. The Utility Permit General Provisions by itself DOES NOT grant permission to the Permittee to work within MDOT SHA rights-of-way.
3. See Section 3.04 - INDIVIDUAL WORK ORDER PERMITS for further information.

3.04 INDIVIDUAL WORK ORDER PERMITS

A) The appropriate MDOT SHA District issues Utility Permits for specific types of utility work to be performed within MDOT SHA rights-of-way. These Utility Permits contains the special requirements, conditions, procedures and contact information required for job specific activities performed by the Permittee and includes work specific attachments, plans and addenda. (These Utility Permits are collectively hereinafter referred to as Individual Work Order Permits.) The types of Individual Work Order Permits issued are as follows:

1. **Utility Construction Permits** are issued for the installation, construction, and relocation; significant removal, replacement, or adjustment; and **major maintenance** of utility infrastructure as needed and requested by the Permittee.

   a) **Major Maintenance** is any maintenance that is beyond the normal, routine upkeep of the facility; cyclical or planned maintenance; new service installations; any activity requiring excavations; and the removal or replacement of poles. Major maintenance activities include any scheduled preventative maintenance involving excavations, including test pitting in non-emergency situations, and require a Utility Construction Permit.

2. **Utility Relocation Permits** are issued for the installation, construction, removal, relocation, replacement and adjustment of utility infrastructure as required by the MDOT SHA. Utility Relocation Permits are issued specifically in connection with MDOT SHA projects.

3. **Utility Blanket Permits** are issued for **minor maintenance** of utility infrastructure and utility work required in **emergency situations**. A Utility Blanket Permit is issued biennially from the appropriate districts for emergencies and minor maintenance activities, so the Permittee would not need to submit numerous individual site-specific Utility Permit Application Packages; however, this does not exempt the Permittee from obtaining required Traffic Control Permits in non-emergency situations.

   a) **Minor Maintenance** is maintenance required to keep an existing utility facility in a good state of repair without adding to its physical makeup or changing its physical capacity. Minor Maintenance activities are routine, low in cost, straightforward, and expedient to correct which are normally accomplished as part of the annual operation and maintenance. Such activities covered in the Utility Blanket Permit would include existing customer service work, pole attachments, lighting repairs, and splicing cables or other work in existing manholes/structures and vaults. Tree trimming activities required to access and maintain the Permittee's facilities are also covered in the Utility Blanket Permit.

   b) **Emergency** is a situation resulting from a sudden, unexpected event or incident which presents a clear and imminent danger requiring immediate action to prevent or mitigate loss or damage to life, health, property or essential public services. Emergency work is any activity, including roadway excavation, to make necessary temporary and permanent repairs to existing or potential unsafe conditions; and includes any work associated with the Emergency thereafter, including roadway excavation, to temporarily and permanently repair/restore essential public services and property, including MDOT SHA rights-of-way. Emergency work is covered in the Utility Blanket Permit. Refer to Section 3.06 EMERGENCY UTILITY REPAIRS for additional information.

c) The Permittee shall notify the appropriate district of any work to be performed under a Utility Blanket Permit.

d) The Permittee shall obtain a Traffic Control Permit from the appropriate district for any non-emergency work to be performed under a Utility Blanket Permit.

4. **Utility Permit Extensions** are issued for the extension of previously issued Utility Construction Permits and/or Utility Relocation Permits when the proposed utility work will not be completed by the expiration date of said permits. Utility Permit Extensions apply to only Utility Construction Permits and Utility Relocation Permits.

a) Blanket Permits shall require the issuance of a new permit upon their expiration.

b) The requirement for submitting an annual Utility Permit Application Package for Utility Blanket Permit(s) will be as determined by each of the appropriate MDOT SHA District(s) for their respective districts.

B) Individual Work Order Permits are Part 2 of obtaining a Complete Authorized Utility Permit.

1. The Permittee shall submit Utility Permit Application Package for all installation, construction, relocation, removal, replacement, adjustment and significant maintenance of utility infrastructure requested by the Permittee, for review and approval, to the appropriate MDOT SHA District(s).

a) The appropriate MDOT SHA District(s) may issue an Individual Work Order Permit provided the Utility Permit Application Package submitted by the Permittee is reviewed, approved and in compliance with MDOT SHA's Utility Manual.

b) Individual Work Order Permits are issued under the signature of the appropriate District Engineer or their approved designee.

2. The Permittee shall attach a copy of the Utility Permit General Provisions to each and every Individual Work Order Permit to comprise a Complete Authorized Utility Permit to allow the Permittee access to MDOT SHA rights-of-way to perform specific activities as requested by the Permittee.

3. An Individual Work Order Permit by itself DOES NOT grant permission to the Permittee to work within MDOT SHA rights-of-way.

4. See Section 3.03 - UTILITY PERMIT GENERAL PROVISIONS for further information.

C) Individual Work Order Permits, except for Blanket Permits, have a term of twelve (12) months or until the work specified in the Work Order Utility Permit has been completed, whichever is shorter.

3.04.01 Utility Permit Application Package Submittal

A) The Permittee shall submit a Utility Permit Application Package for all installation, construction, relocation, removal, replacement, adjustment and significant maintenance work requested by the Permittee, for review and approval, to the appropriate district(s).

1. Significant maintenance work will be as determined by the appropriate district(s).

2. See Engineering Districts Map and the District Office Contact Information in the Appendix for the appropriate district to submit the Utility Permit Application Package.

B) The Permittee shall submit the Utility Permit Application Package to the appropriate district(s) which is to be submitted as three (3) separate packages and each individual package neatly folded to an 8½" X 11" size and shall contain the following items:

1. A copy of the completed and signed permit application.

2. A copy of an 8½" X 11" vicinity map (1" = 1000') with the area of work indicated with a colored pen or pencil.

3. A complete set of plans for the proposed work within the MDOT SHA right-of-way.

a) Refer to Section 2.02.06.01 – Utility Permit Plans for further guidance.

4. A copy of the completed and signed Traffic Control Permit Application.

a) Refer to Section 11.09 – Lane Closings for further guidance.

5. A copy of the Traffic Control Plan or applicable standard.

C) The Utility Permit Application Package shall include one electronic set of plans as per Section 2.02.05 - Electronic Utility Plans as determined by MDOT SHA

D) The Utility Permit Application Package shall provide complete information as to the nature of the work to be done and the impact of the work on the MDOT SHA's right-of-way, highway and its appurtenances.

E) Submittals shall be considered incomplete until all items of the Utility Permit Application Package are received by the appropriate district.

F) Generalized, vague, or incomplete information will delay the review process and could potentially result in MDOT SHA's rejection of the Utility Permit Application Package.

G) Applications for permits shall be signed by a duly authorized representative of the Permittee making the request and submitted to the appropriate District Engineer or their approved designee in whose District the work is being performed.

H) See the Appendix for a map of the Engineering Districts and the addresses of the appropriate District Engineers.

3.05 ABUTTING PROPERTIES

A) MDOT SHA's Utility Permits allow the Permittee to perform work with MDOT SHA rights-of-way only.

1. The Permittee shall be solely responsible for obtaining any additional easements; right of entry's, etc. from abutting property owners necessary for the Permittee to perform any approved work under the Complete Authorized Utility Permit on any other property not under the jurisdiction of the MDOT SHA.

a) Refer to Subsection 3.01 (L) for additional guidance.

B) MDOT SHA shall not be a party in any negotiations between the Permittee and abutting property owners.

3.06 EMERGENCY UTILITY REPAIRS

A) For situations resulting from a sudden unexpected event or incident which presents a clear and imminent danger requiring immediate action to prevent or mitigate loss or damage to life, health, property or essential public services, providing prompt, accurate and continued communication is critical.

1. The Permittee shall notify the MDOT SHA in accordance with Section 3.06.01 – Emergency Utility Repair Notifications.

B) If an emergency situation occurs, the Permittee shall proceed immediately with all necessary actions.

C) Emergency Utility Repairs are covered under the Utility Blanket Permits issued by the appropriate districts. The Permittee does not need to submit another Utility Permit Application Package for the specific Emergency Utility Repair or restoration activities associated with the emergency.

1. However, in the event the Permittee is unable to fully complete MDOT SHA roadway and/or right-of-way restoration within a reasonable amount of time, as agreed to with the appropriate district, after the Emergency Utility Repair, the Permittee may be required to submit a Utility Permit Application Package for said restorations.

D) During an emergency situation the Utility shall protect the public safety while making necessary repairs to the existing facilities.

E) The Utility shall be responsible for safe and efficient traffic control during the Emergency Utility Repair.

F) Incidents involving emergency repairs to attachments to structures, the Utility shall coordinate the repairs with MDOT SHA's Office of Structures.

3.06.01 Emergency Utility Repair Notifications

A) During an emergency situation, it is important to MDOT SHA, to the extent possible, adequately assess the situation, respond to the event or incident, ensure aid is rendered to any injured, assess the impact to MDOT SHA's highway, structure, and/or right-of-way, manage approaching traffic, and open the roadway to traffic as quickly as possible. Therefore, it is important for the Utility to provide enough accurate information when notifying the MDOT SHA of an emergency situation.

1. It is recommended that the Utility use the Utility Emergency Information Checklist in the Appendix in order to have information readily at hand and for requests for any updates of information.

B) If an emergency situation occurs during normal business hours, the Utility shall notify the appropriate district office. See Engineering Districts Map and the District Office Contact Information in the Appendix for the appropriate district to notify.

C) If the emergency occurs during nonbusiness hours, including weekends, the Utility shall contact MDOT SHA's Emergency Operations Center (EOC) at 1-800-543-2515 (Statewide) or 410-582-5630 or the appropriate District Utility Engineer. The Utility shall then notify the appropriate district office the following business day regarding the emergency and with any updated information regarding the situation.

CHAPTER 4

UTILITY CONSTRUCTION

4.01 GENERAL

A) There are two main situations in which the MDOT SHA and the Utility interact with regards to utility construction: utility construction performed under a Utility Permit and utility relocations performed due to an MDOT SHA construction project. Utility construction performed under a Utility Permit is generally less complicated. Coordination for these activities may only involve obtaining a Complete Authorized Utility Permit from the MDOT SHA and notification to the MDOT SHA before utility construction begins. If the work is significant enough to require a pre-construction conference, the only attendees will be the Utility, the Utility's contractor (if used), and the MDOT SHA.

Utility relocations during MDOT SHA construction projects can be much more complicated. Multiple utilities may be involved, along with contractors for each utility. The best scenario is to have all possible utility relocation work finished before highway construction begins. However, if utility relocation works needs to be concurrent with the MDOT SHA's contract, the MDOT SHA's contractor will also be involved with the coordination efforts. With many more groups involved, there is a greater requirement for coordination. Scheduling and pre-construction conferences involving all parties are recommended for relocation projects.

Utilities are most often located in the public right-of-way, meaning that access to underground physical facilities often results in digging and backfilling trenches. Many times, this also means trenching into MDOT SHA roads. Utility cuts and poor repairs can cause costly premature repair and roadway remediation expenses, traffic delays, increased congestion in urban areas and damage to both public and private vehicles.

While it is true that the utility companies' financial success depends on their ability to place facilities and provide services to customers as quickly as possible, Utilities that perform any activity within MDOT SHA right-of-way shall give due regard to the safety of the general public; meeting MDOT SHA's construction schedules; and proper restoration of MDOT SHA's infrastructure and rights-of-way.

B) The Utility shall coordinate any utility work to be performed within the proximity of any MDOT SHA construction or maintenance project; or will have any effect whatsoever on any work performed on a MDOT SHA construction or maintenance project; or will affect Maintenance of Traffic of any other roadway network system in conjunction with any MDOT SHA construction or maintenance project.

1. The Utility shall contact the Project Engineer for that MDOT SHA Project Engineer at least 48 hours in advance of any commencement of utility work to be performed within the proximity of any MDOT SHA construction project.
2. The Utility shall contact the Resident Maintenance Engineer and/or the District Maintenance Office for that area at least 48 hours in advance of any commencement of utility work to be performed within the proximity of any MDOT SHA maintenance project.

C) The Utility shall respond to, and correct, as far as reasonably possible, citizen complaints regarding work performed adjacent to private properties immediately upon notification.

1. Refer to Section 3.05 - ABUTTING PROPERTIES for additional information

D) The MDOT SHA shall not be responsible for repair of any damage to any valves, manholes or any other structure placed in the roadway or shoulder areas by the Utility.

1. The Utility shall be fully responsible for injury to MDOT SHA personnel and damage to MDOT SHA equipment as a result of MDOT SHA equipment striking the Utility's structure.

E) The excavation of any MDOT SHA roadway, which has been recently resurfaced, shall be strictly prohibited for a period of two (2) years from the date the resurfacing has been accepted for maintenance unless approved in writing by the appropriate District Engineer or their approved designee.

F) All open cuts to pavement areas within MDOT SHA right-of-way, when allowed, shall be marked with the appropriate color code as shown in Figure 2.02.04 – Standard Utility Color Identification.

1. The initials of the Utility Company shall be painted within the cut area.

4.02 GUIDANCE DOCUMENTS For UTILITY CONSTRUCTION

A) All utility construction shall be in complete conformance with specifications, standards, provisions and policies of Section 1.08 - GENERAL GUIDANCE DOCUMENTS.

B) In addition to the documents referenced in the previous paragraph, utility construction shall be performed in complete conformance with, and particular attention to, the following links and MDOT SHA publications as applicable to the type of utility facility and/or type of work:

- Manual for Controlling and Reducing the Frequency of Pavement Utility Cuts
- Occupational Safety & Health Administration (OSHA)
- Maryland Occupational Safety and Health (MOSH)
- Book of Standards For Highway & Incidental Structures
- Standard Specifications For Construction And Materials
- Supplemental Specifications and Provisions
- Standard Specifications for Subsurface Explorations

C) Whenever MDOT SHA's Standard Specifications For Construction And Materials is referred to in this Chapter or this Utility Manual, the latest version of the Supplemental Specifications and Provisions shall be reviewed to ensure the most current specification is used.

4.03 SAFETY

A) Workers in highway work zones are exposed to a variety of hazards and face risk of injury and death from construction equipment as well as passing motor vehicles. Workers on foot are exposed to passing traffic, often at high speeds, while workers who operate construction vehicles are at risk of injury due to overturn, collision, or being caught in running equipment. Regardless of the task assigned, all construction workers at times work in conditions of poor lighting, poor visibility, inclement weather, congested work areas, high volume traffic and speeds. As such, slight lapses in safety or awareness that might lead to mild accidents in other construction sites can be deadly for roadway construction workers. The MDOT SHA continuously strives to improve the safety and mobility in work zones with the major emphasis on safety.

B) The Utility shall take all necessary precautions to protect the travelling public, pedestrians, and workers.

C) The Utility shall take all necessary precautions to ensure that its workers have and use all appropriate personal protection apparel and equipment.

D) All Maintenance of Traffic shall be in accordance with CHAPTER 11: MAINTENANCE OF TRAFFIC.

1. Lane Closures shall be in accordance with Section 11.09 – Lane Closures.

2. At the discretion of the MDOT SHA, the Utility may be required to perform the work at night.

E) The Utility shall comply with the High Voltage Line Act of the Labor and Employment Article of the Annotated Code of Maryland, §6–101 through §6–110, and OSHA's Cranes and Derricks in Construction Directive.

F) The MDOT SHA may halt any operation it considers to be in any manner detrimental to the safe operation of MDOT SHA's highway system if the Permittee's operation(s) cannot be continued or resumed in a manner that is of a safe operation of the (State) highway system.

1. In the event the MDOT SHA determines that any operation is detrimental to the safe operation of the (State) highway system, the MDOT SHA will notify the Permittee.

2. The Permittee shall suspend its operation(s) and then work with the MDOT SHA in good faith to determine if and/or how the Permittee's operation(s) can be continued or resumed in a manner that is not detrimental to the safe operation of the (State) highway system.

G) The Utility shall verify the location of all existing buried facilities within or adjacent to the work area to prevent damaging existing utilities.

1. The Utility shall contact "Miss Utility" in compliance with Title 12 – Underground Facilities of the Public Utilities Articles of the Annotated Code of Maryland.

2. The Utility shall maintain vertical and horizontal clearances from all existing utility facilities as required by the respective utility agencies.

H) No access shall be permitted onto MDOT SHA rights-of-way of controlled access roadways or from any connecting ramp for purposes of construction, maintenance, or expansion of an existing facility unless the MDOT SHA determines there is no feasible alternative.

I) Private automobiles and non-essential construction vehicles shall not be parked on MDOT SHA rights-of-way. It shall be the responsibility of the Utility to transport workers to the job site from a separate parking facility procured by the Utility.

J) The use of emergency crossovers is strictly prohibited.

K) All work areas are to be continuously maintained in a neat and clean condition.

L) Mud and debris tracked or spilled on the roadway shall be removed promptly, and precautions shall be taken, especially in freezing temperatures, to keep water off the travelled lanes.

M) Guy wires within 6 feet of the ground will be sheathed in heavy high visibility plastic tubing.

N) Excavations shall not normally be left open overnight, or at any time when work is not in progress in the immediate area.

1. Appropriate protective measures, approved by MDOT SHA, including warning signs and barricades, shall be placed at all excavations.

2. Excavations not closed the same day as opened may require steel plates; the installation of concrete barriers and impact attenuators; and/or any other measures deemed appropriate by MDOT SHA to maintain the safety of the excavation.
3. Steel plates may be used over excavations at locations approved by the MDOT SHA and in accordance with Section 4.07.05 - Steel Plates.
4. When steel plates are used to bridge open excavations in traveled lanes or on shoulders, the utility shall place warning signs in accordance with Section 11.07.01(A) Signing: Steel Plates.

O) All equipment and material shall be removed from the MDOT SHA rights-of-way, or located a minimum of 30 feet from the edge of the existing traveled pavement of MDOT SHA roadways during non-working hours and when not being used in daily construction and maintenance operations.

1. The MDOT SHA may permit equipment and material to be stored closer than 30 feet from the edge of the traveled pavement when there is no practical alternative.
2. Equipment and material shall be protected by an approved positive traffic barrier (i.e. guard rail, temporary concrete traffic barrier, etc.) if stored within the Clear Zone and/or as determined by the MDOT SHA.
   a) Refer to Section 2.01.04 - Clear Zones for additional information.

4.04 INSPECTION

A) MDOT SHA inspectors shall be authorized to inspect all work performed and all material furnished.

1. Such inspection may extend to all or any part of the work and to the preparation, fabrication, or manufacture of the materials to be used as per MDOT SHA's Standard Specifications For Construction And Materials, Sections GP-5.01 AUTHORITY OF THE PROCUREMENT OFFICER and GP-5.07 AUTHORITY AND DUTIES OF INSPECTORS.

B) The MDOT SHA reserves full control over its highways, rights-of-way and the subject matter of the Utility Permit General Provisions and/or any Individual Work Order Permit.

1. MDOT SHA inspectors are assigned the responsibility and authority to conduct inspections of utility work sites, and to obtain and record appropriate data which may impact safety, integrity of the roadway or restoration of the MDOT SHA's right-of-way.
2. On large projects, weekend work, or night work, the MDOT SHA may need to assign inspection forces while work is being accomplished within MDOT SHA right-of-way at the expense of the Permittee.
   a) The MDOT SHA will inform the Permittee if its intent to assign inspection forces prior to commencement of the permit work.

C) The Utility shall provide the MDOT SHA inspector with an intended work schedule and shall inform the MDOT SHA inspector of any subsequent changes to the schedule.

D) The Utility shall provide its own sufficient inspection and/or supervision to ensure the proper installation, construction, removal, relocation, replacement, adjustment and/or maintenance of any utility facilities or infrastructure within MDOT SHA rights-of-way.

4.04.01 Testing

A) The Utility shall perform all testing for all work performed by the Utility within the MDOT right-of-way as required in accordance with all appropriate regulations and current applicable industry codes.

1. The Utility shall make available all test data and results to the MDOT SHA upon request of the MDOT SHA inspector.

B) Depending on the type of work and site conditions, the MDOT SHA may require any additional tests or testing, at its discretion, at the Utility's expense for all work performed by the Utility within the MDOT right-of-way.

1. The additional testing required may include, but not limited to, compaction, surface profile testing, or geophysical surveys to detect subsurface voids.

C) The MDOT SHA may require, if applicable, the collection of video imagery of any drainage or open pipe systems running within MDOT SHA rights-of-way and to provide that video imagery to MDOT SHA for review.

D) All piping installed within the SHA right-of-way shall be tested as required by USDOT - Pipeline and Hazardous Materials Safety Administration.

1. Carrier pipes of all pressurized utilities shall be pressure tested before start-up in accordance with all appropriate regulations and current applicable industry codes.

4.05 MDOT SHA HIGHWAY/FACILITY PROTECTION

A) The Utility shall take all necessary measures to protect any facilities owned or maintained by the MDOT SHA while performing any utility work within MDOT SHA rights-of-way.

1. The Utility shall be responsible for the cost of any repairs to roadway embankments, drainage facilities, or any other facilities owned or maintained by the MDOT SHA should they become necessary as caused by the construction, existence or failure of the utility facility or infrastructure.

B) Equipment with metallic treads shall not be driven or towed on any road surface or surfaced shoulder.

C) Material or equipment not provided with rubber-tired wheels shall not be dragged or skidded across paved surfaces.

D) Excavated or backfill material shall not be placed or stockpiled on any improved surface within MDOT SHA right-of-way or property under the jurisdiction of the MDOT SHA unless specifically approved, in writing, by the appropriate District Engineer or their approved designee.

4.06 TRENCHLESS TECHNOLOGY

A) In general, all trenchless technology applications have the common advantage of reducing the impact to the surface, and to pavement structures. Other benefits include reduced impacts to traffic, and the other costs or impacts associated with traffic congestion.

B) When selecting, the appropriate method determining factors should include, among others, ground conditions, availability of trenchless technology contractors and equipment, cost, safety, and the technical feasibility of the various methods desired. Standard pipe sizes, bore lengths, and depths are also a consideration in determining the appropriate method.

C) Although trenchless technology methods of utility installation and maintenance generally impact the public and surrounding infrastructure to a lesser magnitude than utility cuts, there are some potential impacts that should be understood. Many of the trenchless methods have similar potential impacts; while others have unique impacts that should be considered when deciding on trenchless technology for a project. Potential impacts that should be considered are:

- Bore hole collapse / subsidence.
- Access / reception pit excavation.
- Ground displacement / upheaval.
- Ground vibrations.
- Worker safety.

D) Loose, cohesionless, and granular soils are more susceptible to a bore hole collapse if a casing is not placed immediately after excavation. Jack & boring and tunneling are affected by this type of soil with respect to collapse or subsidence.

E) Trenchless installations shall be performed in complete accordance with submitted plans and specifications approved by the MDOT SHA.

F) The Utility shall assume responsibility in the event of any roadway failure to replace any or all pavement as required in the opinion of the appropriate District Engineer or their approved designee.

G) The Utility shall submit, with the Utility Permit Application, plans of any proposed trenchless installation within MDOT SHA rights-of-way.

1. Plans should be signed by a Professional Engineer licensed in the State of Maryland.

H) The Utility shall obtain approval from MDOT SHA prior to any construction using any method of trenchless installation.

1. All materials used shall be adequate for the intended purpose and method of installation; and shall be approved by the MDOT SHA.

2. The Utility shall request, in writing, specific permission from the MDOT SHA to use any method of trenchless installation not identified in this Utility Manual.

a) The Utility shall submit plans, proposed materials, specifications, and all other pertinent information necessary or requested by the MDOT SHA for review.

4.06.01 Jack & Boring

Jack & Boring is a technique for forming a bore from a drive pit to a reception pit, by means of a rotating cutting head. Spoil is removed back to the drive shaft by helically wound auger flights rotating in a steel casing. The steel casing is simultaneously installed with the auger by hydraulic jacking sections of welded steel pipes to form a continuous steel casing in the ground. See Figure 4.07.01- Jack & Boring.

Jack & Boring has decreased risk of disrupting the surface either by subsidence or heaving, but an experienced operator is necessary to minimize the risk. Jack & Boring can be used in a wide range of soil conditions. Jack & Boring can be used to install any type of pipe or cable.

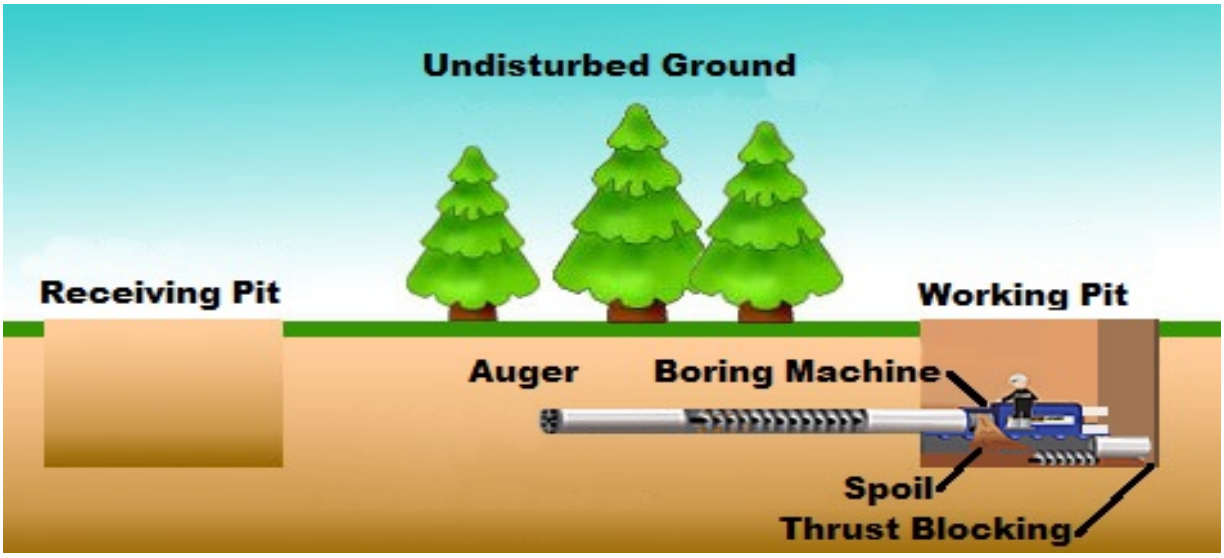


Figure 4.07.01- Jack and Boring

Jack & Boring is generally unsteerable; however, some basic steering systems are available. It also requires working and receiving pits or shafts. As with any trenchless technology application, a thorough site investigation is recommended, primarily to identify obstacles such as large boulders and soft ground. Jack & Boring can accommodate larger rocks, up to one-third the diameter of the casing. In Jack & Boring, the casing should be made of steel, to accommodate the steel augers turning inside the casing. Subsidence is a minor risk in Jack & Boring. There is a greater risk of heaving, however, in Jack & Boring if excessive force applied at the excavation face.

A) Materials

1. **Pipe**
   - **a)** Pipe used in this method includes an external steel casing pipe and may include a variety of interior carrier pipe materials.
   - **b)** Pipes and sleeves shall have sufficient length to extend beyond the ditch line or shoulder edges as directed by the SHA.
     - **i.** Casing pipe shall be used within the entire Roadbed Area of Influence.
     - **ii.** Refer to Section 6.08 - Sleeves and Casings for further guidance.
   - **c)** Pipe shall be specifically designed and certified for Jack & Boring by the pipe manufacturer.
   - **d)** The jetting of pipes or sleeves shall not be permitted.
2. **Allowable forces**
   - **a)** The allowable jacking strength capacity of the casing pipe shall be capable of withstanding the maximum jacking forces imposed by the operation.
   - **b)** Steel casing pipe shall have minimum yield strength of 35,000 psi.

3. Casing Pipe Characteristics

a) Casing pipe materials shall be steel. Alternate materials will require prior approval.

b) Only new casing pipe shall be used, unless otherwise approved by the appropriate District Engineer or their approved designee.

c) Casing pipe shall have a minimum wall thickness of 1/4 inch.

d) Casing pipe shall be round. Casing pipe shall have a roundness tolerance, so that the difference between the major and minor outside diameters shall not exceed 1% of the specified nominal outside diameter, or 0.25 inch, whichever is less.

e) Casing pipe shall have square and machine beveled ends. The pipe end maximum out-of-square tolerance shall be 0.04 inch, (measured across the diameter).

f) Casing pipe shall be straight. The maximum allowable straightness deviation over any 10-foot length of steel casing pipe is 1/8 inch.

g) Pipe shall be without any significant dimensional or surface deformities. All pipes shall be free of visible cracks, holes, foreign material, foreign inclusions, blisters, or other deleterious or injurious faults or defects. Any section of the pipe with a gash, blister, abrasion, nick, scar, or other deleterious fault greater in depth than ten percent (10%) of the wall thickness, shall not be used.

h) Casing pipe shall normally be constructed without any longitudinal seams. However, longitudinally welded casing pipe is allowed for 48 inch or larger diameter pipes when an American Welding Society certified welder performs all the welding.

i) Casing pipe shall have smooth interior and exterior walls to reduce jacking force and prevent casing rotation

j) The inside diameter (ID) of the casing pipe shall be at least 6 inches larger than the largest outside diameter (OD) of the carrier pipe to allow the carrier pipe to be inserted or removed subsequently without disturbing the casing or the roadbed.

4. Casing Spacers

a) Casing spacers are required for all carrier pipes.

b) Casing spacers shall be plastic, fiberglass, or other dielectric material to prevent metal-to-metal contact and damage to pipe and coating during placement.

c) Casing spacers shall be installed at a minimum of one spacer not to exceed ten feet apart.

B) Construction

1. Minimum Allowable Depths

a) The minimum allowable depth of a Jack and Bore installed casing pipe under the road and shoulder surface is listed in Jack and Bore Minimum Depth Table. Any deviation shall require prior approval from appropriate District Engineer or their approved designee.

Minimum Jack & Bore depth under various soil conditions				
Soil Condition	Clay	Silt	Sandy	Gravely
Minimum Depth (feet)	4*	4*	6	6

* The minimum depth of cover under all paved surfaces in controlled access rights-of-way is five feet.

Jack and Bore Minimum Depth Table

b) In locations where the road surface is super elevated, the minimum depth of the bore shall be measured from the lowest side of the pavement surface. In addition, a minimum 3-foot depth shall be maintained in all other features including ditch bottoms unless otherwise directed by appropriate District Engineer or their approved designee.

2. Access Pits

a) Location - A minimum distance, from the edge of the paved shoulder or curb, to the face of any access pit, equipment, and supplies, shall be in accordance with Section 2.01.04 - Clear Zones. Any deviation from these distances shall require prior approval from the appropriate District Engineer or their approved designee. No excavation for pushing pipes shall be made in the shoulder area.

b) Sheeting, Shoring and Bracing –Sheeting, shoring and/or bracing shall be required for the working and receiving access pits in order to prevent failure of the embankments and to maintain safe access to the jack & boring operation. Sheeting shall be furnished and installed as per MDOT SHA's Standard Specifications For Construction And Materials, Sections 402.02.03, 402.04.02 & 405.03. An additional earth retention structure shall be required above and below the bore hole on the drilling face of all access pits to prevent loss of material during construction. This support shall be continuously maintained (including during non-working hours) in order to prevent cave-ins.

c) Protection – Access pits shall be protected at all times to prohibit unauthorized vehicular and pedestrian access. Fencing barriers shall be installed adjacent to access pits, open excavations, equipment and supplies with suitable fencing and plastic drums to prohibit unauthorized pedestrian access to the work site. Equipment shall not be used as fencing to protect access pits.

3. Lead Auger / Overcut Allowance

a) A full-size auger section shall be used as the lead section of the casing. The auger shall not protrude from the leading edge of the casing. However, if soil conditions halt the movement of the casing, the auger shall be allowed to protrude not more than 3 inches in front of the casing during the boring operation. The pipe shall be pushed simultaneously with the auger so as to prevent cave-ins.

b) Overcut is the annular space between the excavated hole and the outside diameter of the casing pipe. The excavated hole is not to exceed the outside diameter of the pipe.

4. Watertight Joints

Water tight pipe joints are required to ensure the integrity of the roadbed. Casing pipe shall be constructed to prevent water leakage or earth infiltration throughout its entire length.

5. Lubrication Fluids

a) Lubrication fluids are specifically required for this method regardless of the soil conditions.

b) Any deviation from the use of lubrication shall require prior approval from the appropriate District Engineer or their approved designee.

c) Lubrication fluids, consisting of a mixture of water and bentonite or bentonite/polymer, shall be used in the annular space between the casing being installed and the native soil. The use of water by itself shall not be permitted.

d) Lubrication may also be used inside the casing pipe to facilitate spoil removal.

e) Grease is not allowed for use as lubrication for this purpose.

6. Pipe locating and tracking

One of the following tracking, locating, and guidance systems shall be used, unless an alternate is approved by the appropriate District Engineer or their approved designee.

- Waterline system.
- Mechanical control head.
- Electronic (inertial) control head.
- Walkover system.
- Laser guided tunnel attachment.
- Laser guided pilot rod.

7. Settlement/Heaving Monitoring

a) This method shall be performed in a manner that will minimize the movement of the ground in front of, above, and surrounding the Jack & Boring operation; and will minimize subsidence of the surface above and in the vicinity of the boring. The ground shall be supported in a manner to prevent loss of ground and keep the perimeter and face of the boring stable at all times, including during shutdown periods.

b) Potential heave or settlement shall be monitored at each shoulder point, edge of pavement, the edge of each lane (or centerline for two lane roads), and otherwise at 50-foot intervals along the pipe centerline.

c) A survey shall be performed one day prior to initiating this operation at each required monitoring location. A similar survey shall then be performed at each location, on a daily basis, until the permitted activity has been completed. All survey readings shall be recorded to the nearest one-hundredth (0.01) of a foot. Digital photographs of the pavement conditions shall also be taken prior and after the pipe installation.

i. All surveys shall be performed by or certified by a State of Maryland certified surveyor.

d) All operations shall stop immediately whenever monitored points indicate a vertical change in elevation of 1/2 inch or more, or any surface disruption is observed. The Contractor shall then immediately report the amount of settlement to the appropriate District Engineer or their approved designee.

8. Ground Water Control

a) Dewatering shall be conducted whenever there is a high ground water table level to prevent flooding and facilitate the operation. The water table elevation shall be maintained at least 2 feet below the bottom of the casing at all times. When needed, dewatering may be initiated prior to any excavation.

b) Minor water seepage or pockets of saturated soil may be effectively controlled through bailing or pumping. This control shall be accomplished without removing any adjacent soil that could weaken or undermine any access pit, its supports, or other nearby structure.

c) Larger volumes of ground water shall be controlled with one or more well points or with staged deep wells. Well points and staged deep well pumping systems shall be installed and operated without damage to property or structures, and without interference with the rights of the public, owners of private property, pedestrians, vehicular traffic, or the work of other contractors. Any pumping methods used for de-watering and control of ground water and seepage shall have properly designated filters to ensure that the adjacent soil is not pumped along with the water. Well diameter, well spacing and the pump's pumping rate, shall provide adequate draw down of the water level. Wells shall be located to intercept ground water that otherwise would enter the access pit excavation and interfere with the work. Upon removal of a well, the hole shall be filled in accordance with MDOT SHA's Standard Specifications For Construction And Materials.

- **i.** The Utility shall be required to obtain permits for any wells needed for dewatering as per COMAR 26.04.04.
  1. At the sole discretion of the MDOT SHA, the Utility may be required to comply with well abandonment-sealing that is more robust than COMAR.
  2. Information regarding Well Construction Permits and Well Abandonment-Sealing Permits can be obtained from the following website: http://www.mde.maryland.gov/programs/Water/Water_Supply/Pages/WellConstructionPermit.aspx

d) Existing storm drains shall only be used to discharge water from the dewatering operation in accordance with a permit obtained from the appropriate storm drain owner. Filters or sediment control devices shall be required to ensure that the existing system is not adversely affected by construction debris or sediment.

e) If grouting is used to prevent ground water from entering the area of the access pit, the grouting shall be installed without damage to property or structures and without interference with the rights of the public, owners of private property, pedestrians, vehicular traffic, or the work of other contractors. The material properties of the grout shall conform to MDOT SHA's Standard Specifications For Construction And Materials.

9. Failure

a) Should anything prevent completion of this operation, Utility shall immediately inform the MDOT SHA.

- **i.** The remainder of the bore shall be constructed and/or abandoned by methods approved by the MDOT SHA.

b) Voids resulting from false starts or damage to the over-burden shall be filled by pressure grouting or other method approved by MDOT SHA.

c) Any abandoned bores shall be completely filled with flowable backfill or other method approved by the MDOT SHA.

i. For areas approved to be filled with flowable backfill, the Utility shall place and cure the Controlled Low Strength Material as directed by the MDOT SHA and in accordance with MDOT SHA's Standard Specifications For Construction And Materials, Section 314 - Flowable Backfill.

d) In the event that any equipment or tools becomes stuck or lost during installation (and irretrievable without excavation); or some other situation arises that prevents completion of the installation; the MDOT SHA, at its sole discretion, may require the abandonment in place of any component(s) of the installation.

i. Any component(s) of the installation that MDOT SHA requires to be abandoned in place shall be at the sole expense of the Utility.

10. Contamination

a) If an area of contaminated ground is encountered, all operations shall stop immediately, and shall not proceed until approved by the MDOT SHA.

b) Any slurry tested positive for contamination shall be disposed of in accordance with the requirements of MDOT SHA's Standard Specifications For Construction And Materials, Section TC-6.09 - Hazardous Material.

11. Bulkhead

Casing ends shall be enclosed or bulkheaded with a commercial grade concrete, or approved alternate to seal the ends to prevent water leakage or earth infiltration. The concrete shall extend longitudinally into the pipe end opening to create a minimum one-foot thick bulkhead barrier, or as required by the Utility Permit. Any deviation shall require prior approval from the appropriate District Engineer or their approved designee.

12. Work Site Restoration

1. Access pits and excavations shall be backfilled in accordance with Section 4.08.01 - Backfilling with suitable material, and in a method approved by the MDOT SHA. Any embedded supports shall be removed. At the sole discretion of the MDOT SHA, embedded supports may be removed to 1 foot below the original ground surface or finished grade, whichever is lower.

2. The disturbed work site area shall be restored to existing grades and materially to its original condition in accordance with Section 4.08 - RESTORATION. The extent of repairs or replacement shall be determined at the sole discretion of the MDOT SHA. Restoration shall begin immediately upon completion of the installation of the utility facility.

3. Any disturbed grass areas shall be restored (topsoiled, seeded, fertilized, mulched, anchored, etc.) in accordance with MDOT SHA's Standard Specifications For Construction And Materials, Category 700 – Landscaping.

4. Upon completion of the work, the contractor shall remove and properly dispose of all excess materials and equipment from the work site.

4.06.02 Horizontal Directional Drilling

Horizontal directional drilling (HDD): A steerable system for the installation of pipes, conduits, and cables in a shallow arc using a surface launched drilling rig. Traditionally HDD is applied to large scale crossings such as rivers in which a fluid filled pilot bore is drilled without rotating the drill string (Figure 4.06.02-1. Pilot Hole), and this is then enlarged by a wash over pipe and back reamer to the size required for the carrier pipe (Figure 4.06.02-2 Preream); and finally the carrier pipe is pulled back through the bore (Figure 4.06.02-3 Pullback).

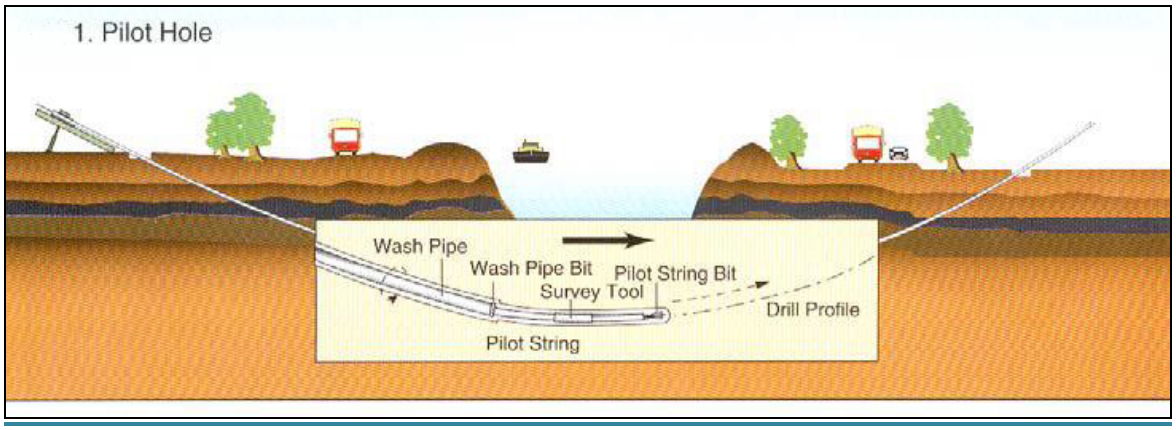


Figure 4.06.02-1. Pilot Hole

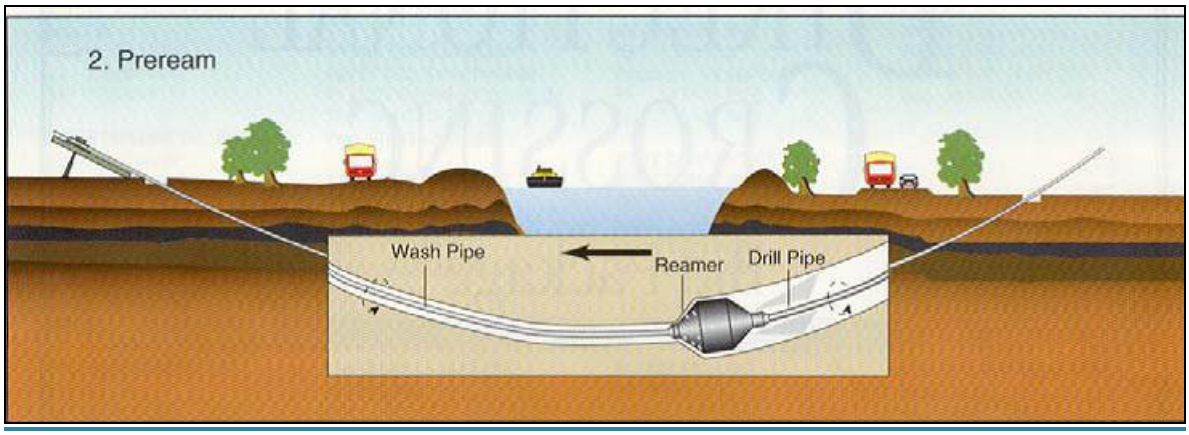


Figure 4.06.02-2 Preream

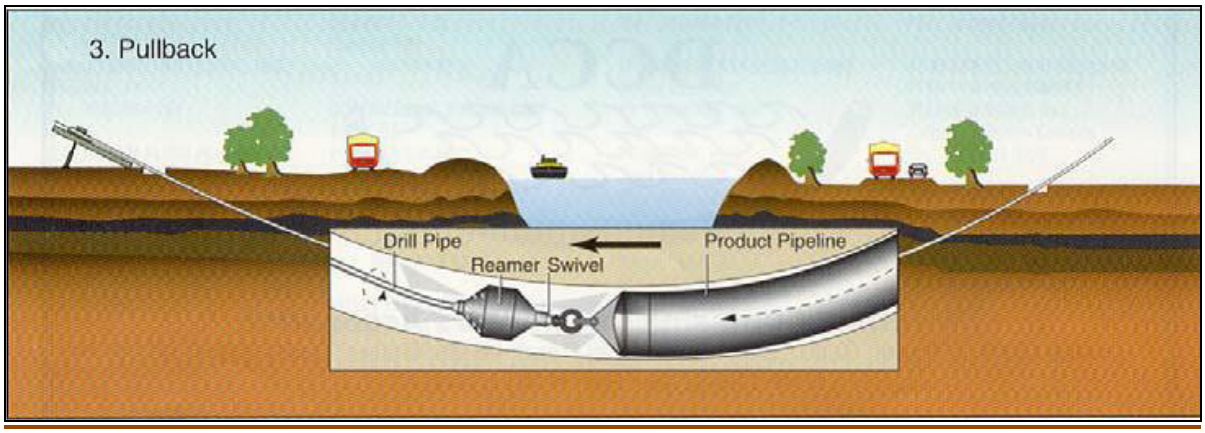


Figure 4.06.02-3 Pullback

In general, the advantages of HDD are similar to those of the entire trenchless technology industry. HDD allows for rapid installation and relatively large pipelines can be installed over long distances. HDD can be made accurately, and safety is greatly improved when used in conjunction with subsurface utility engineering. Line and level available are controllable. Mini-HDD equipment is portable, self-contained, and is designed to work in small, congested areas.

Limitations on HDD include the amount of space required to develop the underground access points. A relatively large area may be required for the drilling rig and associated equipment at the drill entry point. Another large area is generally required at the drill exit point, although surface entry operations can reduce the need for access shafts. Other limitations include the possibility that the bore may collapse in some granular soils and gravels and lose its steering ability in soft soil. Ground movement must be considered, especially in midi- and maxi-HDD applications. The pressure and high flow rates of the drilling fluid can cause some excess soil to erode, which leaves a void outside the installed pipe, which may eventually collapse. Additionally, pressure may cause the drilling fluid to flow into a soil stratum as the drilling head advances, potentially causing heaving of that soil layer. Drilling fluid can also seep to the surface in shallow cover. Other limitations include excessive torque and thrust applied to the drill stem, especially in curving boreholes, which can cause drill stem failure in mini-HDD application.

A) Materials

1. Pipe

a) Approved materials for HDD include: high-density polyethylene (HDPE), steel, fusible PVC, and restrained joint PVC.

i. Alternate materials will require prior approval.

ii. HDPE pipes shall conform to the current ASTM D1248, ASTM D3350, and ASTM F714.

iii. Steel pipe shall conform to the current ASTM A 53-97 and ASTM 139-96.

iv. PVC pipe shall conform to the current ASTM F1962-99 and ASTM D2321-00.

2. Allowable forces

The pulling force shall not exceed the pipe manufactures recommendation. When using HDPE pipe, an extra six-foot section of the pipe shall be pulled out of the borehole to check for any sign of stress or damage.

3. Pipe Characteristics

a) HDPE pipe shall have a Standard Dimension Ratio (SDR) value of 11 or less.

b) Pipe shall be without any significant dimensional or surface deformities. All pipes shall be free of visible cracks, holes, foreign material, foreign inclusions, blisters, or other deleterious or injurious faults or defects. Any section of the pipe with a gash, blister, abrasion, nick, scar, or other deleterious fault greater in depth than ten percent (10%) of the wall thickness, shall not be used.

4. Protective Coatings (Steel Pipe)

A coating to provide a corrosion barrier as well as an abrasion barrier is required. The coating shall be bonded well to the pipe and have a hard, smooth surface to resist soil stresses and reduce friction. A mill-applied fusion bonded epoxy coating is required for steel pipes.

B) Construction

1. Minimum Allowable Depths

a) The minimum allowable installation depth of cover of a HDD installed pipe, cables or ducts under all paved surfaces is correlated to the pipe diameter. The HDD Minimum Depth Table summarizes the minimum allowable depths:

	Minimum Allowable HDD Depths				
Pipe Diameter (inches)	3 or less	4-6	7 - 12	13- 24	24 and greater
Depth of Cover (feet)	3*	5	8	10	12

* The minimum depth of cover under all paved surfaces in controlled access rights-of-way is five feet.

HDD Minimum Depth Table

b) In locations where the road surface is superelevated, the minimum depth of the bore shall be measured from the lowest side of the pavement surface. In addition, a minimum 3-foot depth shall be maintained in all other features including ditch bottoms.

c) The top of all pipes, cables and ducts must be buried a minimum of five feet below streambed when crossing waters or wetlands.

2. Method

a) The ends of each section of HDPE pipe shall be inspected and cleaned as necessary to be free of debris immediately prior to joining the pipes by means of thermal butt-fusion. The Polyethylene pipe shall be of the same type, grade, and class of the polyethylene compound used in the process.

b) The handling of the joined pipeline shall be in such a manner that the pipe is not damaged by dragging it over sharp or jagged objects. Sections of the pipes with cuts and gouges exceeding 10 percent of the pipe wall thickness or kinked sections shall be removed and the ends rejoined.

c) Pipe rollers, skates or other protective devices shall be used to prevent damage to the pipe, eliminate ground drag, reduce pulling force, and reduce the stress on the pipe and joints.

d) Sufficient space shall be allocated to fabricate and layout the product pipeline into one continuous pipe length, thus enabling the pull back to be conducted during a single operation.

i. If space considerations are discovered that make this impossible, the Utility shall submit an alternative plan to the MDOT SHA for review and approval.

e) The required piping shall be assembled in a manner that does not obstruct adjacent roadways or public activities.

f) The drill path alignment shall be as straight as possible to minimize the frictional resistance during pullback and maximize the length of the pipe that can be installed during a single pull.

g) The minimum radius of curvature of HDD path should be 1,200 times the nominal diameter of the pipe to be installed.

h) For large diameters (greater than 20 in), an intermediate pre-reaming is required before pulling the utility into place.

i) The drilling fluid in the annular region outside of the pipe shall not be removed after installation and remain in place to provide support for the pipe and neighboring soil.

3. Drilling Site

a) Location - A minimum distance, from the edge of the paved shoulder or curb, to the face of any access pit, equipment, and supplies, shall be in accordance with Section 2.01.04 - Clear Zones. Any deviation from these distances shall require prior approval from the appropriate District Engineer or their approved designee. No excavation for pushing pipes shall be made in the shoulder area.

b) Protection – Drilling sites shall be protected at all times to prohibit unauthorized vehicular and pedestrian access. Fencing barriers, as required, shall be installed adjacent to equipment and supplies with suitable fencing and plastic drums to prohibit unauthorized pedestrian access to the work site. Equipment shall not be used as fencing to protect drilling sites.

4. Overcut Allowance

The overcut diameter shall not exceed the outside diameter (OD) of the pipe by more than 1.5 times to ensure excessive voids are not created resulting in post installation settlement.

5. Watertight Joints

Water tight pipe joints are required to ensure the integrity of the roadbed. Pipe shall be constructed to prevent water leakage or earth infiltration throughout its entire length.

6. Drilling Fluids

a) Drilling fluid shall be used during drilling and back reaming operations.

b) Excess drilling fluids shall be contained within a tanker truck, or trailer mounted portable tank, until removed from the site and suitably disposed of at an authorized waste site.

c) All drilling fluids shall not enter the streets, manholes, sanitary and storm drains, and other drainage systems, including streams and rivers.

7. Pipe Locating and Tracking-

The following requirements may be waived depending on size, bores and/or conditions:

a) During construction, continuous monitoring and plotting of pilot drill progress shall be undertaken to ensure compliance with the proposed installation alignment. The Utility shall plot the actual horizontal and vertical alignment of the pilot bore at each edge of pavement and at intervals not exceeding 20 feet. This “as built” plan and profile shall be updated as the pilot bore is advanced.

b) The Utility shall at all times provide and maintain instrumentation that will accurately locate the pilot hole and measure drilling fluid quantity. The Utility shall grant the MDOT SHA access to all data and readout pertaining to the position of the bore head, the fluid pressures, and flows.

c) Trace wire is required for all non-metallic pipe installation for post construction location purposes.

8. Settlement/Heaving Monitoring

a) This method shall be performed in a manner that will minimize the movement of the ground in front of, above, and surrounding the boring operation; and will minimize subsidence of the surface above and in the vicinity of the boring. The ground shall be supported in a manner to prevent loss of ground and keep the perimeter and face of the boring stable at all times, including during shutdown periods.

b) Potential heave or settlement shall be monitored at each shoulder point, each edge of pavement, the edge of each lane (or centerline for two lane roads), and otherwise at 50-foot intervals along the pipe centerline.

c) For pipe sizes larger than 3 inches, a survey shall be performed one day prior to initiating this operation at each required monitoring location. A similar survey shall then be performed at each location, on a daily basis, until the permitted activity has been completed. All survey readings shall be recorded to the nearest one-hundredth (0.01) of a foot. Digital photographs of the pavement conditions shall also be taken prior and after the pipe installation.

i. All surveys shall be performed by or certified by a State of Maryland certified surveyor.

d) All operations shall stop immediately whenever monitored points indicate a vertical change in elevation of 1/2 inch or more, or any surface disruption is observed. The Utility shall then immediately report the amount of settlement to the MDOT SHA.

9. Failure

a) Should anything prevent completion of this operation, the Utility shall immediately inform the MDOT SHA.

i. The remainder of the bore shall be constructed and/or abandoned by methods approved by the MDOT SHA.

b) Voids resulting from any abandoned bore, false start or damage to the over-burden shall be filled by pressure grouting or other method approved by MDOT SHA.

c) In the event that any equipment or tools becomes stuck or lost during installation (and irretrievable without excavation); or some other situation arises that prevents completion of the installation; the MDOT SHA, at its sole discretion, may require the abandonment in place of any component(s) of the installation.

i. Any component(s) of the installation that MDOT SHA requires to be abandoned in place shall be at the sole expense of the Utility.

10. Contamination

a) If an area of contaminated ground is encountered, all operations shall stop immediately, and shall not proceed until approved by the MDOT SHA.

b) Any slurry tested positive for contamination shall be disposed of in accordance with the requirements of MDOT SHA's Standard Specifications For Construction And Materials, Section TC-6.09 - Hazardous Material.

11. Bulkhead

Pipe ends shall be temporarily sealed with a cap until the connection is made permanent, to prevent water or earth infiltration.

12. Cable, Conduit, and Cable Splicing

a) Exposed cables and ducts at splicing locations are to be protected utilizing orange safety fence installed a minimum height of four feet. Perimeter safety fencing around ducts and cables is to be securely maintained at all times.

b) Support for exposed cables or ducts at splicing locations must be installed by the permittee. The temporary attachment of cables or ducts to existing poles, signs, trees or other existing fixed objects is strictly prohibited.

c) Splicing and handhole installation shall proceed with cable or duct installation.

13. Work Site Restoration

a) Access pits and excavations shall be backfilled in accordance with Section 4.08.01 - Backfilling with suitable material, and in a method approved by the MDOT SHA.

b) The disturbed work site area shall be restored to existing grades and materially to its original condition in accordance with Section 4.08 - RESTORATION. The extent of repairs or replacement shall be determined at the sole discretion of the MDOT SHA. Restoration activities shall commence within seven days of the placement of cable, duct, or pipe between each handhole location.

c) Any disturbed grass areas shall be restored (topsoiled, seeded, fertilized, mulched, anchored, etc.) in accordance with MDOT SHA's Standard Specifications For Construction And Materials, Category 700 – Landscaping.

d) Upon completion of the work, the contractor shall remove and properly dispose of all excess materials and equipment from the work site.

4.06.03 Tunneling

Tunneling is the method by which a tunnel section is assembled. A horizontal bore is manually or mechanically excavated from inside the assembled tunnel to a point a short distance in front of the tunnel. With a Liner Plate tunnel, (Figure 4.06.03-1 - Liner Plate Tunnel) additional sections of liner plate are assembled to support the excavated area. With a Pipe Jacking tunnel, (Figure 4.06.03-2 - Pipe Jacking Tunnel) additional sections of pipe are added and then pneumatically pushed into the excavated area. Spoil is generally removed manually through the tunnel to the working access pit. If used properly, tunneling can have a low risk of surface disruption. Subsidence can be kept to about 1 in.

As with most trenchless applications tunneling requires a skilled operator who can make adjustments based on almost imperceptible changes in the operation of the machines. Again, a thorough site investigation is essential to the success of the project. Access shafts are required at both ends of the tunnel. Soil characteristics can have a significant effect on the choice and application of the tunnel, including the bore face excavation, which must be properly supported to prevent sudden collapse. Since the definition of tunneling compared to other trenchless technologies is that workers are present inside the tunnel, the safety of the operators is most important.

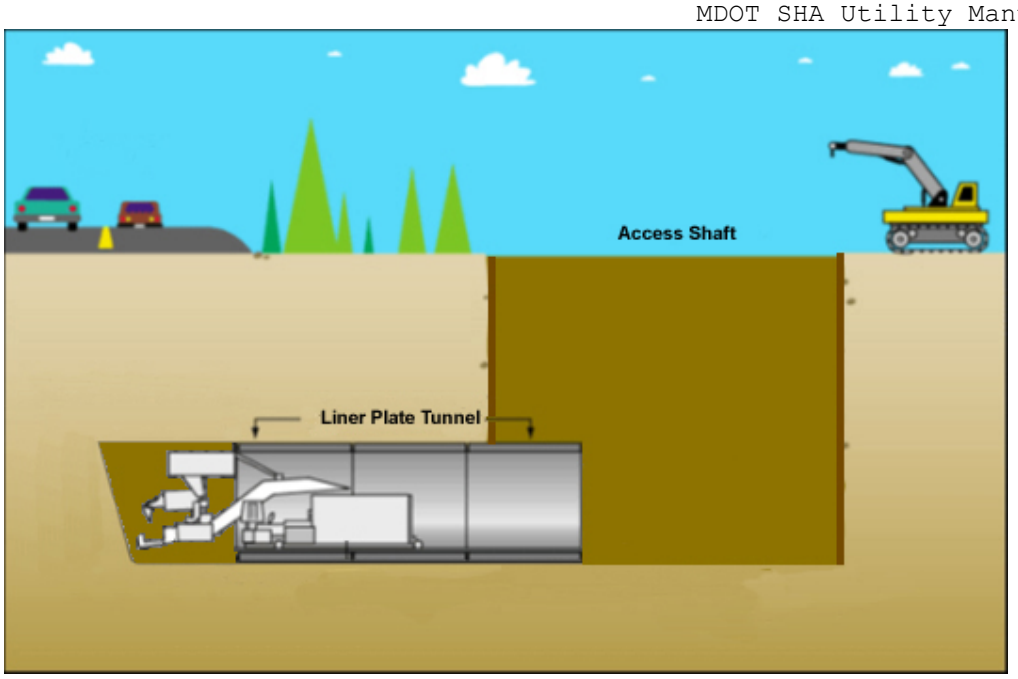


Figure 4.06.03-1 - Liner Plate Tunnel

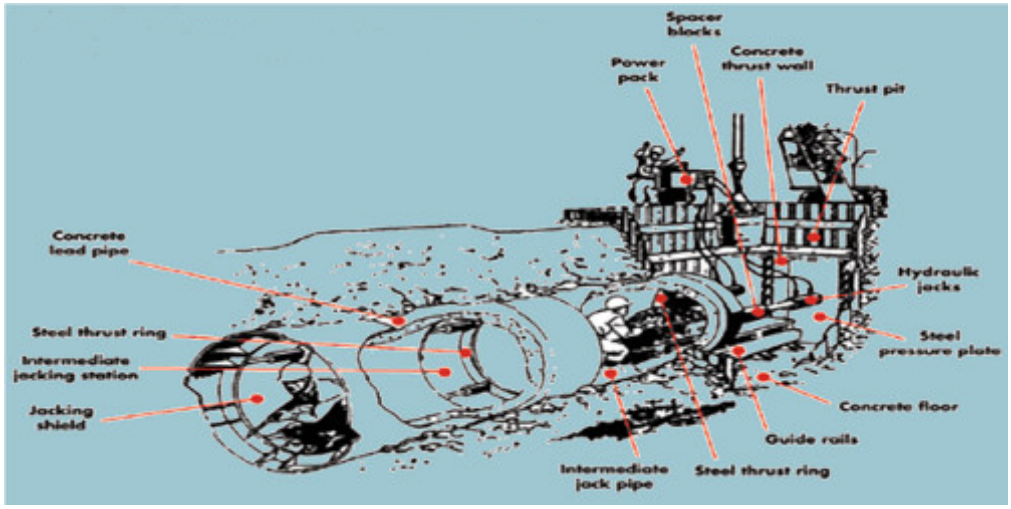


Figure 4.06.03-2 - Pipe Jacking Tunnel

As this Section 4.06.03 Tunneling discusses 2 methods of tunneling, the standards, specifications, and policies stated in this section shall apply to both tunneling methods unless specifically stated to apply to a particular tunneling method.

4.06.03.01 Design

A) Any tunneling within MDOT SHA rights-of-way shall be in complete conformance with specifications, standards, provisions and policies of Section 1.08 - GENERAL GUIDANCE DOCUMENTS.

B) In addition to the documents referenced in the previous paragraph, any tunneling within MDOT SHA rights-of-way shall be in complete conformance with, and particular attention to, the specifications, standards, provisions and policies of the following agencies, organizations, institutes and publications where applicable:

1. Chapter 9: Bridges and Other Structures
2. AASHTO Technical Manual for Design and Construction of Road Tunnels – Civil Elements
3. AASHTO Standard Specifications for Highway Bridges, Section 26

C) The Utility shall submit the following items for review and approval by MDOT SHA:

1. Complete design data including working or Shop Drawings.
2. Written procedure describing in detail proposed tunnel method of construction (Tunnel Boring Machine (TBM) or hand excavation).
3. Written procedure describing in detail the entire operation.
4. Subsoil surveys, including the elevation of the water table and the classification and relative density of the soils from the ground line to 3 ft below the tunnel liner.
5. Rock coring data, including rock type and core recovery, where required.
6. Water control plans, where required.
7. **Certified Test Reports:**
   - **a)** Tunnel liner plate segments for tunnel lining.
   - **b)** Tunnel liner plate connectors.

D) All plans for tunneling operations must be approved by a State of Maryland Professional Engineer.

E) For any proposed tunneling within MDOT SHA rights-of-way, the Utility shall submit a request for review and approval for both the OOS and the appropriate District Engineer or their approved designee.

1. In addition to the information submitted as per this Section 4.06.03 (A) - Design and Section 3.04.01 - Utility Permit Application Package Submittal, the Utility shall submit information as per Section 9.07 - STRUCTURES REVIEW PROCESS.
2. All requests for proposed tunneling shall be made to the appropriate District Engineer unless otherwise directed by the appropriate District Engineer.
3. Approval for proposed tunneling shall be from the appropriate District Engineer or their approved designee via the Utility Permit unless work is Utility 3rd Party Work incorporated into MDOT SHA's construction project.

4.06.03.02 Materials

A) Tunnel Liner

1. Tunnel Liners may include a variety of materials depending on the tunnel method of construction.
2. Tunnels shall have sufficient length to extend beyond the ditch line or shoulder edges as directed by the MDOT SHA.
   - **a)** Tunnel Liners shall extend the entire Roadbed Area of Influence.
   - **b)** Refer to Section 6.08 - Sleeves and Casings for further guidance.

3. Tunnel Liners shall be specifically designed and certified for the tunnel method of construction by the manufacturer.
4. The inside diameter (ID) of the tunnel liner shall be at least 6 inches larger than the largest outside diameter (OD) of the carrier pipe to allow the carrier pipe to be inserted or removed subsequently without disturbing the tunnel liner or the roadbed.

B) Tunnel Liner Characteristics

1. Steel Liner Plates

a) Liner Plate:

i. Steel liner plates shall be hot-dipped galvanized, bituminous-coated of the size, thickness, and sectional modulus specified.

ii. Steel liner plates shall be made of hot-rolled, cold-formed steel that conform to ASTM A1011/A1011M with the following mechanical properties before cold forming:

a) Tensile strength: 42,000 psi.
b) Yield strength: 28,000 psi.
c) Elongation, 2 inches: 30 percent.
d) Minimum liner plate thickness shown on Drawings.

b) Flanged Joints:

i. Steel liner plates shall be formed to provide circumferential flanged joints.

ii. Longitudinal joints shall be flanged or offset lap seam type.

iii. Steel liner plates shall be punched for bolting on both longitudinal and circumferential seams or joints.

iv. Bolts in circumferential flanges shall be spaced according to the manufacturer's standard spacing.

v. Bolts shall be spaced so that plates with the same curvature are interchangeable and will permit staggering of longitudinal seams.

c) Longitudinal Seams:

Lapped longitudinal seams shall be of the bolt size and spacing in accordance with the manufacturer's standard and meets the longitudinal seam strength requirements of Section 16 of AASHTO Standard Specifications for Highway Bridges.

d) Tolerances:

Liner plate segments not complying with following tolerances shall be replaced:

i. The liner plate thickness shall have a maximum variation of plus or minus 0.01 inch.

ii. Liner plates shall be fabricated so that similar segments of any individual ring are interchangeable with the similar segments of other rings.

iii. Bolt holes shall be spaced so 2 rings may be bolted in any relative position with same size bolts in every bolt hole.

iv. Bolt holes shall have a maximum diameter tolerance of plus or minus 0.02 inch from specified diameter.

e) Coatings:

i. Liner plate coatings shall be hot dipped galvanized following ASTM A123/A123M with fully coated, shop-applied bituminous coat, Type A following AASHTO M190.

a) Liner plates shall have a prime coat to assure compatibility with galvanized surface.

ii. Bolts and Nuts shall be galvanized following ASTM A153/A153M-09.

iii. Protect coatings from damage during storage and transportation to Contract site.

f) Bolts and Nuts shall be Grade A, with rolled threads on bolts following ASTM A307.

g) Liner Plate Grout Holes:

i. Each ring shall have grout holes 2 in. or larger in diameter in the top plates at intervals 10 ft or less. This will permit grouting while the tunnel liner is erected.

ii. For larger tunnels, or where conditions make more grout openings advisable, additional plates with grout holes shall be installed at the top quarter points and/or on each side between the top openings. Stagger these additional openings but keep the distance between them 10 ft or less in any one line.

2. Steel Pipe – Pipe Jacking

a) Only new steel pipe shall be used, unless otherwise approved by the appropriate District Engineer or their approved designee.

b) Steel pipe shall be smooth walled with a minimum wall thickness of 3/8 inch.

c) Steel pipe shall have minimum yield strength of 35,000 psi.

d) Steel pipe shall be round. Casing pipe shall have a roundness tolerance, so that the difference between the major and minor outside diameters shall not exceed 1% of the specified nominal outside diameter, or 0.25 inch, whichever is less.

e) Steel pipe shall have square and machine beveled ends. The pipe end maximum out-of-square tolerance shall be 0.04 inch, (measured across the diameter).

f) Steel pipe shall be straight. The maximum allowable straightness deviation over any 10-foot length of steel casing pipe is 1/8 inch.

g) Steel pipe shall be without any significant dimensional or surface deformities. All pipes shall be free of visible cracks, holes, foreign material, foreign inclusions, blisters, or other deleterious or injurious faults or defects. Any section of the pipe with a gash, blister, abrasion, nick, scar, or other deleterious fault greater in depth than ten percent (10%) of the wall thickness, shall not be used.

h) Joints shall be fully welded around circumference of pipe.

i. Welds shall have sufficient strength to withstand forces at pipe joints without distortion of pipes.

i) Longitudinally welded steel pipe may be allowed when an American Welding Society certified welder performs all the welding.

j) Steel pipe shall have smooth interior and exterior walls to reduce jacking force and prevent casing rotation.

3. Reinforced Concrete Pipe (RCP) – Pipe Jacking

a) Reinforced Concrete Pipe shall be minimum Class IV, with concrete joint and smooth exterior without joint bulge.

b) Reinforced Concrete Pipe shall meet ASTM C76.

c) Resilient material shall be used for placement in joint to prevent concrete damage when jacking forces are applied.

d) All joints shall consist of an elastomeric sealing element and a compression cushion ring as required by applicable ASTM and ASCE standards.

4. Steel Pipe and RCP Grout Holes – Pipe Jacking

a) Steel Pipe and RCP shall have grout holes 2 in. or larger in diameter at the top of the pipe at intervals 10 ft or less. This will permit grouting after the tunnel liner is installed.

b) For larger tunnels, or where conditions make more grout openings advisable, additional grout holes shall be installed at the top quarter points and/or on each side of the pipe. Stagger these additional openings but keep the distance between them 10 ft or less in any one line.

C) Allowable forces - Pipe Jacking

The allowable jacking strength capacity of the tunnel pipe shall be capable of withstanding the maximum jacking forces imposed by the operation.

D) Casing Spacers

1. Casing spacers are required for all carrier pipes.

2. Casing spacers shall be plastic, fiberglass, stainless steel, or other dielectric material to prevent metal-to-metal contact and damage to pipe and coating during placement.

3. Casing spacers shall be installed at a minimum of one spacer not to exceed ten feet apart.

4.06.03.03 Construction

A) Safety

Safety is of the utmost importance to the MDOT SHA. It is therefore incumbent upon the Utility to ensure that all construction complies with the following requirements:

1. All construction comply with all applicable Federal, State, County, and MDOT SHA, ordinances, codes, statutes, rules, and regulations.

2. All construction comply with all applicable requirements of OSHA 29CFR 1926, "Safety and Health Regulations for Construction," and applicable criteria of ANSI A10.16-1995 (R2001), "Safety Requirements for Tunnels, Shafts, and Caissons."

3. Tunnel construction shall not to interfere with, interrupt, or endanger surface and activity thereon.

4. Subsidence shall be minimized to prevent any impacts to the surface, structures, and utilities above and in vicinity of tunnel.

5. The tunnel excavation shall be supported continuously to prevent loss of ground and keep perimeters and face of tunnel, passages, and shafts stable.
6. All tunneling operations shall be performed from the working pit end of the tunnel.
7. All tunnel construction shall be complete at one location before beginning work at another.
8. If the MDOT SHA determines that tunneling is endangering overpassing roadway or the traveling public, all tunnel operations shall stop until the necessary corrections have been made to the satisfaction of the MDOT SHA.
9. Whenever the tunnel operation is suspended, the Utility shall support the tunnel face with a well-braced, temporary bulkhead and keep dewatering system operating. No more than 1 ft of tunnel shall be unlined at the end of the day's operation.
10. Blasting within MDOT SHA right-of-way is strictly prohibited without prior approval. Refer to Section 4.07.06 – Blasting for further guidance.

B) Minimum Allowable Depths

1. The minimum allowable depth of a tunnel under the road and shoulder surface is listed in Tunnel Minimum Depth Table. Any deviation shall require prior approval from appropriate District Engineer or their approved designee.

Minimum tunnel depth under various soil conditions				
Soil Condition	Clay	Silt	Sandy	Gravely
Minimum Depth (feet)	4*	4*	6	6

* The minimum depth of cover under all paved surfaces in controlled access rights-of-way is five feet.

Tunnel Minimum Depth Table

2. In locations where the road surface is super elevated, the minimum depth of the tunnel shall be measured from the lowest side of the pavement surface. In addition, a minimum 3 foot depth shall be maintained in all other features including ditch bottoms unless otherwise directed by appropriate District Engineer or their approved designee.

C) Access Pits

1. Location - A minimum distance, from the edge of the paved shoulder or curb, to the face of any access pit, equipment, and supplies, shall be in accordance with Section 2.01.04 - Clear Zones. Any deviation from these distances shall require prior approval from the appropriate District Engineer or their approved designee. No excavation for tunneling shall be made in the shoulder area.
2. Sheeting, Shoring and Bracing –Sheeting, shoring and/or bracing shall be required for the working and receiving access pits in order to prevent failure of the embankments and to maintain safe access to the tunneling operation. Sheeting shall be furnished and installed as per MDOT SHA's Standard Specifications For Construction And Materials, Sections 402.02.03, 402.04.02 & 405.03. An additional earth retention structure shall be required above and below the tunnel bore hole on the face of all access pits to prevent loss of material during construction. This support shall be continuously maintained (including during non-working hours) in order to prevent cave-ins.
3. Protection – Access pits shall be protected at all times to prohibit unauthorized vehicular and pedestrian access. Fencing barriers shall be installed adjacent to access pits, open

excavations, equipment and supplies with suitable fencing and plastic drums to prohibit unauthorized pedestrian access to the work site. Equipment shall not be used as fencing to protect access pits.

D) Tunnel Equipment

1. All power machinery and tools operated within tunnel shall be by electricity, compressed air, diesel with approved scrubber, or other approved power.

2. Electrical tools and equipment shall be grounded following latest requirements of NEC.

3. Temporary electric lights shall be used to properly and safely illuminate tunnel construction area, including special illumination at working face.

a) Lighting circuits shall be thoroughly insulated and separate from power circuits, and with lights enclosed in wire cages.

b) The Utility shall secure any electrical permits required for successful completion of this work.

E) Ventilation and Air Quality

The Utility shall operate and maintain an installed ventilation system to meet all OSHA, MOSH and safety requirements for duration of tunnel project.

F) Tunnel Operations

1. General

a) The tunnel face and periphery of the excavation shall be controlled using spaced support procedures such as breast plates, poling plates, face jacks, sliding tables, either singly or in combination.

b) Qualified personnel shall monitor conditions daily for anything that might threaten tunnel stability.

2. Liner Plate Tunnel Excavation

When excavating for a Liner Plate Tunnel, the Utility shall comply with the following requirements:

a) Excavation shall advance in increments sufficient for placement of 1 ring of liners and liner plates shall be installed immediately after each increment of excavation.

b) Full or partial shields, tunneling machines, or other equipment shall not be used that exerts a force on the liner plates to propel, steer, or stabilize the equipment.

c) Excavate so voids behind liner plates are minimized. See Section 4.06.03.03 (G) Overcut Allowance for more information.

d) Voids shall be completely filled with grout placed under pressure as specified in Section 4.06.03.03 (I) Grouting.

3. Liner Plate Tunnel Installation

When installing liner plates, the Utility shall comply with the following requirements:

a) The same type of liner plates shall be used for the full length of the tunnel.

b) Liner plates shall be bolted according to the manufacturer's recommendations.

c) The steel liner plates shall be constructed to fit the tunnel cross section and shall be assembled with staggered longitudinal joints.

d) Liner plates shall be installed to avoid damage to liner plates or coating.

e) Damaged liner plates shall be replaced, and damaged coating shall be repaired to MDOT SHA's acceptance.

f) Foreign matter shall be cleaned from surfaces of flanges, which will be in contact with each other, avoiding damage to coating in cleaning process.

g) Surfaces shall be kept free from material that could interfere with proper bearing and water tightness.

h) The inside dimensions of ring measured along the diameter at any location shall not vary more than 3 percent of liner plate diameter.

4. Pipe Jacking Tunnel Excavation

When excavating for a Pipe Jacking Tunnel, the Utility shall comply with the following requirements:

a) Excavation shall be advanced in increments not to exceed two feet.

b) Tunnel pipe shall be jacked immediately upon the completion of each excavation increment.

c) Excavation is to be conducted so that the voids behind the tunnel pipe are kept to a minimum.

G) Overcut Allowance

Overcut is the annular space between the excavated bore and the outside diameter of the tunnel. When tunneling, the allowable overcut shall not exceed the outside tunnel cross section (Liner Plate Tunnel) or pipe radius (Pipe Jacking Tunnel) by more than one inch.

H) Watertight Joints

Water tight pipe joints are required to ensure the integrity of the roadbed. Tunnels shall be constructed to prevent water leakage or earth infiltration throughout its entire length.

I) Grouting

1. General

a) Grout shall have a minimum compressive strength of 100 psi, attained within 24 hours, and sufficiently fluid to inject through lining and fill voids, with prompt setting to control grout flow.

b) Grouting equipment shall meet the following requirements:

i. Equipment shall have a minimum capacity of one-half (½) cubic yard to assure that adequate grouting material is available within a reasonable period of time to avoid the setting up of grout from the previous batch.

ii. Equipment shall deliver grout in smooth even flow without surge.

iii. Equipment shall develop a uniform pressure at the grout hole connection sufficient to fill voids without disturbing the tunnel liner, adjacent utilities, structures, or roadways.

iv. Hoses shall have a minimum inside diameter of 1-1/2-inches.

c) Grouting shall proceed as follows:

i. Grout each adjacent set of holes progressively.

ii. Proceed from lowest grout hole of each ring/section, grouting progressively upward.

iii. When going from lower to higher grout holes, do not make connection to higher holes until grout has completely filled space below.

iv. Continue grouting until grout appears in next set of grout holes, which shall be kept open during grouting to permit escape of air and water.

v. Upon completion of grouting, all holes shall be plugged with the fitting provided.

2. Grouting - Liner Plate Tunnel

In addition to the grouting requirements in Section 4.06.03.03 (I) 1 - General, the Utility shall comply with the following requirements for Liner Plate Tunnels:

a) Bulkheads shall be sufficiently secure to insure proper seal and prevent the leakage of grout under pressure.

b) Grouting is to begin as soon as a sufficient length of tunnel liner plate has been installed to insure a proper seal, but at no time leave more than 2 liner plate rings ungrouted.

c) Grouting is to proceed progressively with each adjacent set of holes provided in liner plates.

d) All voids shall be completely filled when work is interrupted or prior to the end of each shift.

3. Grouting - Pipe Jacking Tunnel

In addition to the grouting requirements in Section 4.06.03.03 (I) 1 - General, the Utility shall comply with the following requirements for Pipe Jacking Tunnels:

a) Pressure grouting of the annulus shall begin as soon as practical after installation, displacing the bentonite lubrication.

b) Grouting shall be more frequently if soil conditions dictate.

c) Before grouting tunnel pipe, seal between the tunnel pipe and the surrounding soil at each end of the tunnel to retain the grouting pressure.

J) Lubrication Fluids (Pipe Jacking)

1. Lubrication fluids are specifically required for Pipe Jacking tunnel method regardless of the soil conditions.

2. Any deviation from the use of lubrication shall require prior approval from the appropriate District Engineer or their approved designee.

3. Lubrication fluids, consisting of a mixture of water and bentonite or bentonite/polymer, shall be used in the annular space between the tunnel being installed and the native soil. The use of water by itself shall not be permitted.

4. Grease is not allowed for use as lubrication for this purpose.

K) Tunnel Locating and Tracking

1. During construction, continuous monitoring and plotting of the tunneling progress shall be undertaken to ensure compliance with the proposed installation alignment. The Utility shall plot the actual horizontal and vertical alignment of the tunnel at each edge of pavement and at intervals not exceeding 20 feet. This "as built" plan and profile shall be updated as the tunnel is advanced.
2. The Utility shall at all times provide and maintain instrumentation that will accurately locate the tunnel.

L) Settlement/Heaving Monitoring

1. Tunneling shall be performed in a manner that will minimize the movement of the ground in front of, above, and surrounding the tunneling operation; and will minimize subsidence of the surface above and in the vicinity of the tunneling. The ground shall be supported in a manner to prevent loss of ground and keep the perimeter and face of the tunnel stable at all times, including during shutdown periods.
2. Potential heave or settlement shall be monitored at each shoulder point, edge of pavement, the edge of each lane (or centerline for two lane roads), and otherwise at 50 foot intervals along the tunnel centerline.
3. A survey shall be performed one day prior to initiating this operation at each required monitoring location. A similar survey shall then be performed at each location, on a daily basis, until the permitted activity has been completed. All survey readings shall be recorded to the nearest one-hundredth (0.01) of a foot. Digital photographs of the pavement conditions shall also be taken prior and after the tunnel installation.
   a) All surveys shall be performed by or certified by a State of Maryland certified surveyor.
4. All operations shall stop immediately whenever monitored points indicate a vertical change in elevation of 1/2 inch or more, or any surface disruption is observed. The Contractor shall then immediately report the amount of settlement to the appropriate District Engineer or their approved designee.

M) Ground Water Control

1. Dewatering shall be conducted whenever there is a high ground water table level to prevent flooding and facilitate the operation. The water table elevation shall be maintained at least 2 feet below the bottom of the tunneling at all times. When needed, dewatering may be initiated prior to any excavation.
2. Minor water seepage or pockets of saturated soil may be effectively controlled through bailing or pumping. This control shall be accomplished without removing any adjacent soil that could weaken or undermine any access pit, its supports, or other nearby structure.
3. Larger volumes of ground water shall be controlled with one or more well points or with staged deep wells. Well points and staged deep well pumping systems shall be installed and operated without damage to property or structures, and without interference with the rights of the public, owners of private property, pedestrians, vehicular traffic, or the work of other contractors. Any pumping methods used for de-watering and control of ground water and seepage shall have properly designated filters to ensure that the adjacent soil is not pumped along with the water. Well diameter, well spacing and the pump's pumping rate, shall provide adequate draw down of the water level. Wells shall be located to intercept ground

water that otherwise would enter the access pit excavation and interfere with the work. Upon removal of a well, the hole shall be filled in accordance with MDOT SHA's Standard Specifications For Construction And Materials.

a) The Utility shall be required to obtain permits for any wells needed for dewatering as per COMAR 26.04.04.

i. At the sole discretion of the MDOT SHA, the Utility may be required to comply with well abandonment-sealing that is more robust than COMAR.

ii. Information regarding Well Construction Permits and Well Abandonment-Sealing Permits can be obtained from the following website: http://www.mde.maryland.gov/programs/Water/Water_Supply/Pages/WellConstructionPermit.aspx

4. Existing storm drains shall only be used to discharge water from the dewatering operation in accordance with a permit obtained from the appropriate storm drain owner. Filters or sediment control devices shall be required to ensure that the existing system is not adversely affected by construction debris or sediment.

5. If grouting is used to prevent ground water from entering the area of the access pit, the grouting shall be installed without damage to property or structures and without interference with the rights of the public, owners of private property, pedestrians, vehicular traffic, or the work of other contractors. The material properties of the grout shall conform to MDOT SHA's Standard Specifications For Construction And Materials.

N) Bulkheads, Manholes and Vents

Depending on the transmittant of the carrier pipe or conduit will determine if the ends of the tunnel are to be enclosed with a bulkhead or have a manhole and/or vent constructed. The criteria used in Section 6.08 - Sleeves and Casings would be for utility tunnels.

1. Bulkheads

Tunnel ends shall be enclosed or bulkheaded with a commercial grade concrete, or approved alternate to seal the ends to prevent water leakage or earth infiltration. The concrete shall extend longitudinally into the pipe end opening to create a minimum one foot thick bulkhead barrier, or as required by the Utility Permit. Any deviation shall require prior approval from the appropriate District Engineer or their approved designee.

2. Manholes and Vents

Tunnels minimize undermining of the highway in the event of damage or rupture to the carrier pipe of pressurized utilities. Construct a manhole and/or vent at each end of the tunnel or casing as required by the Utility Permit. (See Section 6.08 - Sleeves and Casings, for further guidance.) Any deviation shall require prior approval from the appropriate District Engineer or their approved designee.

O) Failure

1. Should anything prevent completion of this operation, the Utility shall immediately inform the MDOT SHA.

a) The remainder of the tunnel shall be constructed and/or abandoned by methods approved by the MDOT SHA.

2. Voids resulting from false starts or damage to the over-burden shall be filled by pressure grouting or other method approved by the MDOT SHA.
3. Any abandoned tunnel shall be completely filled with flowable backfill or other method approved by the MDOT SHA.
   a) For areas approved to be filled with flowable backfill, the Utility shall place and cure the Controlled Low Strength Material as directed by the MDOT SHA and in accordance with MDOT SHA's Standard Specifications For Construction And Materials, Section 314 - Flowable Backfill.
4. In the event that any equipment or tools becomes stuck or lost during installation (and irretrievable without excavation); or some other situation arises that prevents completion of the installation; the MDOT SHA, at its sole discretion, may require the abandonment in place of any component(s) of the installation.
   a) Any component(s) of the installation that MDOT SHA requires to be abandoned in place shall be at the sole expense of the Utility.

P) Contamination

1. If an area of contaminated ground is encountered, all operations shall stop immediately, and shall not proceed until approved by the MDOT SHA.
2. Any slurry tested positive for contamination shall be disposed of in accordance with the requirements of MDOT SHA's Standard Specifications For Construction And Materials, Section TC-6.09 - Hazardous Material.

Q) Work Site Restoration

1. Access pits and excavations shall be backfilled in accordance with Section 4.08.01 - Backfilling with suitable material, and in a method approved by the MDOT SHA. Any embedded supports shall be removed. At the sole discretion of the MDOT SHA, embedded supports may be removed to 1 foot below the original ground surface or finished grade, whichever is lower.
2. The disturbed work site area shall be restored to existing grades and materially to its original condition in accordance with Section 4.08 - RESTORATION. The extent of repairs or replacement shall be determined at the sole discretion of the MDOT SHA. Restoration shall begin immediately upon completion of the installation of the utility facility.
3. Any disturbed grass areas shall be restored (topsoiled, seeded, fertilized, mulched, anchored, etc.) in accordance with Section 5.04(D) - Landscape and Site Restoration and MDOT SHA's Standard Specifications For Construction And Materials, Category 700 – Landscaping.
4. Upon completion of the work, the contractor shall remove and properly dispose of all excess materials and equipment from the work site.

4.06.04 Impact Moling or Missiling

Impact Moling or Missiling is the use of a tool which comprises a percussive hammer within a suitable casing, generally of torpedo shape. The hammer may be pneumatic or hydraulic. The term is usually associated with non-steered devices without rigid attachment to the launch pit, relying upon

the resistance (friction) of the ground for forward movement. During operation the soil is displaced, not removed. An unsupported bore may be formed in suitable ground, or a pipe drawn in, or pushed in, behind the impact moling tool. Cables may be drawn in. Impact moling is non-steerable (See Figure 4.06.04 - Impact Moling or Missiling).

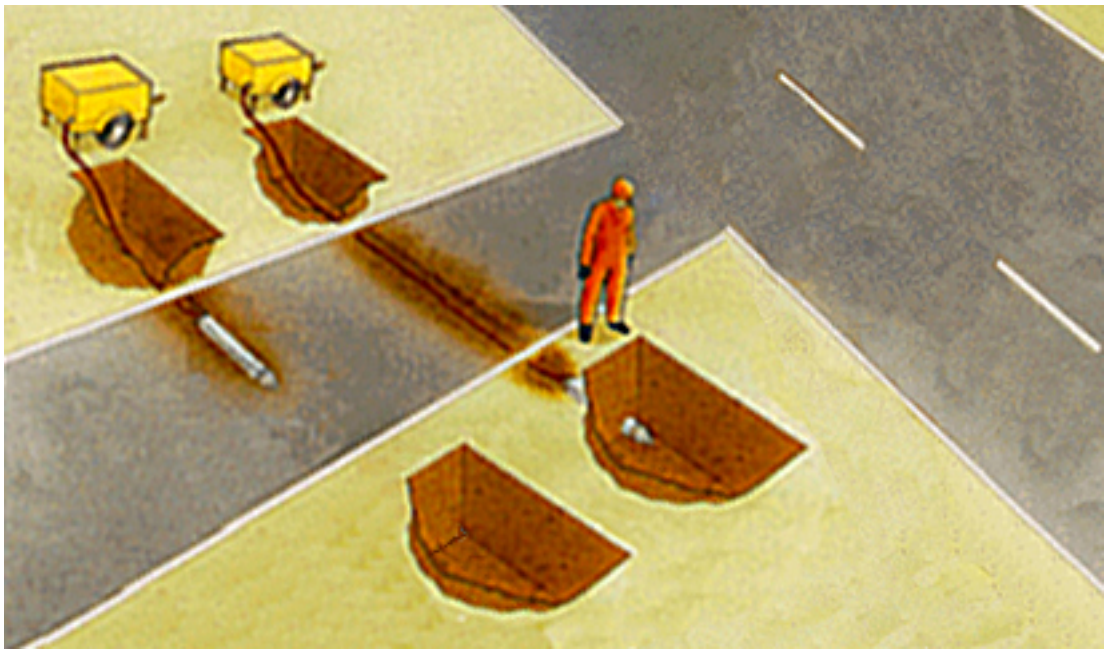


Figure 4.06.04 – Impact Moling or Missiling

A) Potential Impacts on Pavements and Adjacent Utilities

1. Loose, cohesionless, and granular soils are more susceptible to bore hole collapse if a casing is not placed immediately after excavation. Impact moling or missiling is very affected by this type of soil with respect to collapse or subsidence.

Impact moling or missiling can cause outward ground displacement along the pipe alignment. The displacement is typically localized, and their effects dissipate rapidly away from the impact moling tool operation. Some causes for displacement or upheaval include:

- The pipe to be installed is shallow.
- The ground displacement is directed upwards.
- The impact moling tool is deflected by a boulder or some other object.

These displacements can also cause damage to nearby utilities if they are within two to three times the diameter of the impact moling tool. Ground vibration can affect the surrounding soil and adjacent structures. This can be caused by pneumatic pipe bursting or pipe ramming, as well as impact moling or missiling.

2. Impact moling or missiling shall be strictly prohibited when another unprotected underground utility or facility is located within 3 feet from the impact moling tool.

3. Impact moling or missiling shall be allowed only as approved by the appropriate District Engineer or their approved designee and only for installations under private entrances or median crossovers unless specifically approved by MDOT SHA.

B) Materials

1. Pipe

b) Approved materials for HDD include: high-density polyethylene (HDPE), steel, fusible PVC, and restrained joint PVC.

i. Alternate materials will require prior approval.

ii. HDPE pipes shall conform to the current ASTM D1248, ASTM D3350, and ASTM F714.

iii. Steel pipe shall conform to the current ASTM A 53-97 and ASTM 139-96.

iv. PVC pipe shall conform to the current ASTM F1962-99 and ASTM D2321-00.

2. Allowable forces

The pulling force shall not exceed the pipe manufactures recommendation.

3. Pipe Characteristics

a) HDPE pipe shall have a Standard Dimension Ratio (SDR) value of 11 or less.

b) Pipe shall be without any significant dimensional or surface deformities. All pipes shall be free of visible cracks, holes, foreign material, foreign inclusions, blisters, or other deleterious or injurious faults or defects. Any section of the pipe with a gash, blister, abrasion, nick, scar, or other deleterious fault greater in depth than ten percent (10%) of the wall thickness, shall not be used.

C) Construction

1. Minimum Allowable Depths

a) The minimum allowable installation depth of cover of moling/missiling pipe, cables or ducts under all paved surfaces is correlated to the pipe diameter. Impact Moling/Missiling Minimum Depth Table summarizes the minimum allowable depths:

Impact Moling/Missiling Minimum Allowable Depth		
Pipe Diameter (inches)	4 or less	5 - 6
Depth of Cover (feet)	5	6

Impact Moling/Missiling Minimum Depth Table

b) In locations where the road surface is superelevated, the minimum depth of the moling/missiling shall be measured from the lowest side of the pavement surface. In addition, a minimum 3-foot depth shall be maintained in all other features including ditch bottoms.

c) The top of all pipes, cables and ducts must be buried a minimum of five feet below streambed when crossing waters or wetlands.

2. Method

a) Correct alignment of the moling/missiling tool in the insertion pit is extremely important for any impact moling/missiling project, but especially for non-steerable mole/missile where bore accuracy cannot be achieved without the correct starting alignment. Specially designed aim and launch equipment can assure that the moling/missiling is aligned both

vertically and horizontally before the boring starts. Such equipment includes an aiming frame, a surveyor's stake, a starting cradle and anchor stakes. Smaller moles are usually hand-launched, while larger moles may need a starting cradle for launching.

b) Small diameter moles/missiles are usually laid on the bottom of the pit and pointed at the receiving pit. Once the tool is aligned, it should be run into the ground with reduced power until it is one third into the ground. Then the launching should be stopped, and the alignment checked, and if necessary corrected. Until the mole/missile is completely in the ground, it may be necessary to check and correct the line and grade several times.

c) Larger moles/missiles should use a starting cradle for exact alignment of grade and direction. (See Figure 4.06.04 Moling/Missiling Tool Alignment.) First the cradle is lowered into the pit and the mole/missile centered on the cradle. The anchor stakes are driven into place to fix the cradle to the pit floor, and the cradle adjusted both vertically and horizontally with the adjusting screws. Launching with stops for checking and correcting the alignment should be done as for smaller moles/missiles.

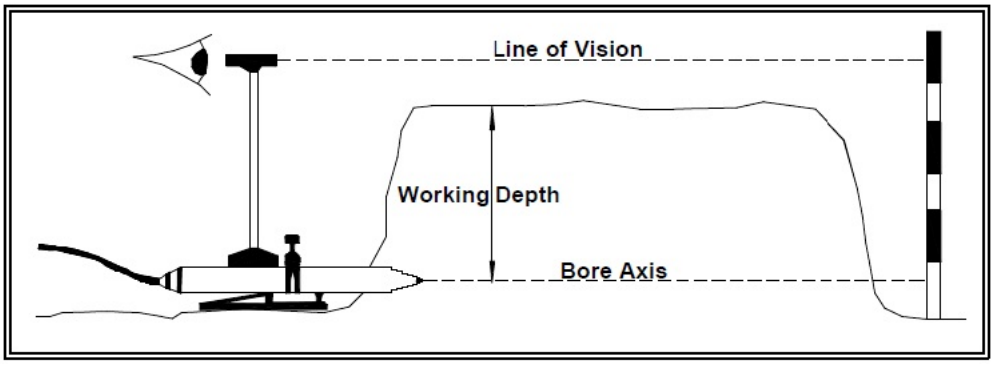


Figure 4.06.04 Moling/Missiling Tool Alignment

3. Moling/Missiling Site

a) Location - A minimum distance, from the edge of the paved shoulder or curb, to the face of any access pit, equipment, and supplies, shall be in accordance with Section 2.01.04 - Clear Zones. Any deviation from these distances shall require prior approval from the appropriate District Engineer or their approved designee. No excavation for moling/missiling shall be made in the shoulder area.

b) Protection – Moling/missiling sites shall be protected at all times to prohibit unauthorized vehicular and pedestrian access. Fencing barriers, as required, shall be installed adjacent to equipment and supplies with suitable fencing and plastic drums to prohibit unauthorized pedestrian access to the work site. Equipment shall not be used as fencing to protect moling/missiling sites.

4. Oversize Allowance

Oversize is the annular space between the moling/missiling bore and the outside diameter of the pipe, duct or cable. When using this method, the allowable oversize bore diameter is 15-25% larger diameter than the pipe, conduit or cable diameter.

5. Watertight Joints

Water tight pipe joints are required to ensure the integrity of the roadbed. Any pipe or duct installed shall be constructed to prevent water leakage or earth infiltration throughout its entire length.

6. Settlement/Heaving Monitoring

a. This method shall be performed in a manner that will minimize the movement of the ground in front of, above, and surrounding the boring operation; and will minimize subsidence of the surface above and in the vicinity of the moling/missiling. The ground shall be supported in a manner to prevent loss of ground and keep the perimeter and face of the moling/missiling stable at all times, including during shutdown periods.

b. Potential heave or settlement shall be monitored at each edge of pavement and the centerline along the pipe centerline.

c. For pipe sizes larger than 4 inches, a survey shall be performed one day prior to initiating this operation at each required monitoring location. A similar survey shall then be performed at each location, on a daily basis, until the permitted activity has been completed. All survey readings shall be recorded to the nearest one-hundredth (0.01) of a foot. Digital photographs of the pavement conditions shall also be taken prior and after the pipe installation.

i. All surveys shall be performed by or certified by a State of Maryland certified surveyor.

d. All operations shall stop immediately whenever monitored points indicate a vertical change in elevation of 1/2 inch or more, or any surface disruption is observed. The Utility shall then immediately report the amount of settlement to the MDOT SHA.

7. Failure

a. Should anything prevent completion of this operation, the Utility shall immediately inform the MDOT SHA.

i. The remainder of the bore shall be constructed and/or abandoned by methods approved by the MDOT SHA.

b. Voids resulting from any abandoned bore, false start or damage to the over-burden shall be filled by pressure grouting or other method approved by the MDOT SHA.

c. In the event that any equipment or tools becomes stuck or lost during installation (and irretrievable without excavation); or some other situation arises that prevents completion of the installation; the MDOT SHA, at its sole discretion, may require the abandonment in place of any component(s) of the installation.

i. Any component(s) of the installation, MDOT SHA required to be abandoned in place, shall be at the sole expense of the Utility.

8. Contamination

a) If an area of contaminated ground is encountered, all operations shall stop immediately, and shall not proceed until approved by the MDOT SHA.

b) Any spoil tested positive for contamination shall be disposed of in accordance with the requirements of MDOT SHA's Standard Specifications For Construction And Materials, Section TC-6.09 - Hazardous Material.

9. Bulkhead

Any conduit or pipe installed shall have ends temporarily sealed with a cap until the connection is made permanent, to prevent water or earth infiltration.

10. Cable, Conduit, and Cable Splicing

a) Exposed cables and ducts at splicing locations are to be protected utilizing orange safety fence installed a minimum height of four feet. Perimeter safety fencing around ducts and cables is to be securely maintained at all times.

b) Support for exposed cables or ducts at splicing locations must be installed by the permittee. The temporary attachment of cables or ducts to existing poles, signs, trees or other existing fixed objects is strictly prohibited.

c) Splicing shall proceed with cable or duct installation.

11. Work Site Restoration

a) Access pits and excavations shall be backfilled in accordance with Section 4.08.01 - Backfilling with suitable material, and in a method approved by the appropriate District Engineer or their approved designee.

b) The disturbed work site area shall be restored to existing grades and materially to its original condition in accordance with Section 4.08 - RESTORATION. The extent of repairs or replacement shall be determined at the sole discretion of the MDOT SHA. Restoration activities shall commence within seven days of the placement of cable or duct between access pit locations.

c) Any disturbed grass areas shall be restored (topsoiled, seeded, fertilized, mulched, anchored, etc.) in accordance with MDOT SHA's Standard Specifications For Construction And Materials, Category 700 – Landscaping.

d) Upon completion of the work, the contractor shall remove and properly dispose of all excess materials and equipment from the work site.

4.07 EXCAVATION

A) New crossings and replacement of existing crossings, of existing highways shall normally be accomplished by a trenchless method such as jack & boring, tunneling, or horizontal directional drilling under the highway without disturbing the existing pavement, shoulder or drainage.

B) It is understood that there are conditions where trenchless applications are not appropriate, such as emergencies, where immediate trenching of the pavement is necessary, and advanced planning simply cannot be done. In other cases, conditions such as the nature of the soils and rocks below the surface, or the presence and/or uncertain location of existing utilities may preclude the use of trenchless technology.

1. Where unusual conditions indicate use of another construction method, such method shall be subject to the approval of the appropriate District Engineer or their approved designee.

C) All excavations and trenching shall be performed in complete accordance with all requirements set forth by OSHA, MOSH and MDOT SHA regulations.

D) When the MDOT SHA allows excavations within the MDOT SHA rights-of-way, the Utility shall minimize excavations performed within pavement areas.

E) All excavations, open cuts, or trenching to be performed across pavement areas shall be saw cut to the full depth of the pavement prior to removal.

F) Cuts or excavations shall not be permitted to remain open at the end of a work shift, or when work is not actively in progress. In the event that excavation cannot be completed within a single shift, the excavation shall be covered with steel plates, or protected behind concrete barrier wall.

1. In addition, the perimeter of all open excavations such as access, working or receiving pits shall be secured using chain link fencing or other approved pedestrian protection along with orange safety fencing suitably posted.

G) Sheeting, shoring and/or bracing shall be required for any excavations or trenches within the Roadbed Area of Influence; as required by MOSH and/or OSHA; and/or as determined by MDOT SHA in order to prevent failure of the embankments and to maintain safe access.

1. See Section 4.07.01 - Sheeting, Shoring and Bracing for additional information.

2. See Figure 9.04-1 – Bridge Structure Zone of Influence for additional information.

3. See Section 4.07.02 - Roadbed Area of Influence for further guidance.

H) All spoil material shall be completely removed from SHA right-of-way.

I) The Utility shall be responsible for repairing any damage due to settlement of backfill.

4.07.01 Sheeting, Shoring and Bracing

A) Sheeting, shoring and/or bracing shall be required for any excavations within the Roadbed Area of Influence; within the Zone of Influence of any bridge or traffic structure; as required by MOSH and/or OSHA; and/or as determined by MDOT SHA in order to prevent failure of the embankments and to maintain safe access.

B) Tight sheeting will be required where the distance off the roadside edge of any excavation is less than the depth of the excavation.

1. The roadside face must be tightly sheeted and braced securely against skeleton sheeting on the opposite or far side of the excavation.

2. When, in the opinion of the MDOT SHA, and field conditions dictate, tight sheeting may be required.

3. The Utility shall install all tight sheeting in accordance with all OSHA, MOSH and MDOT SHA regulations.

C) Sheeting shall be furnished and installed as per MDOT SHA's Standard Specifications For Construction And Materials, Sections 402.03, 402.04.02 & 405.03.

D) All sheeting must be completely removed upon the completion of excavation and backfill activities.

1. Metal sheeting systems may be used with prior approval of the MDOT SHA and pulled only as tamped fill progresses.

2. If the excavation is to be left open, it shall be tight sheeted and shall comply with all other requirements of this Section 4.07 - Excavation.

E) See Section 4.07.02 - Roadbed Area of Influence for further guidance.

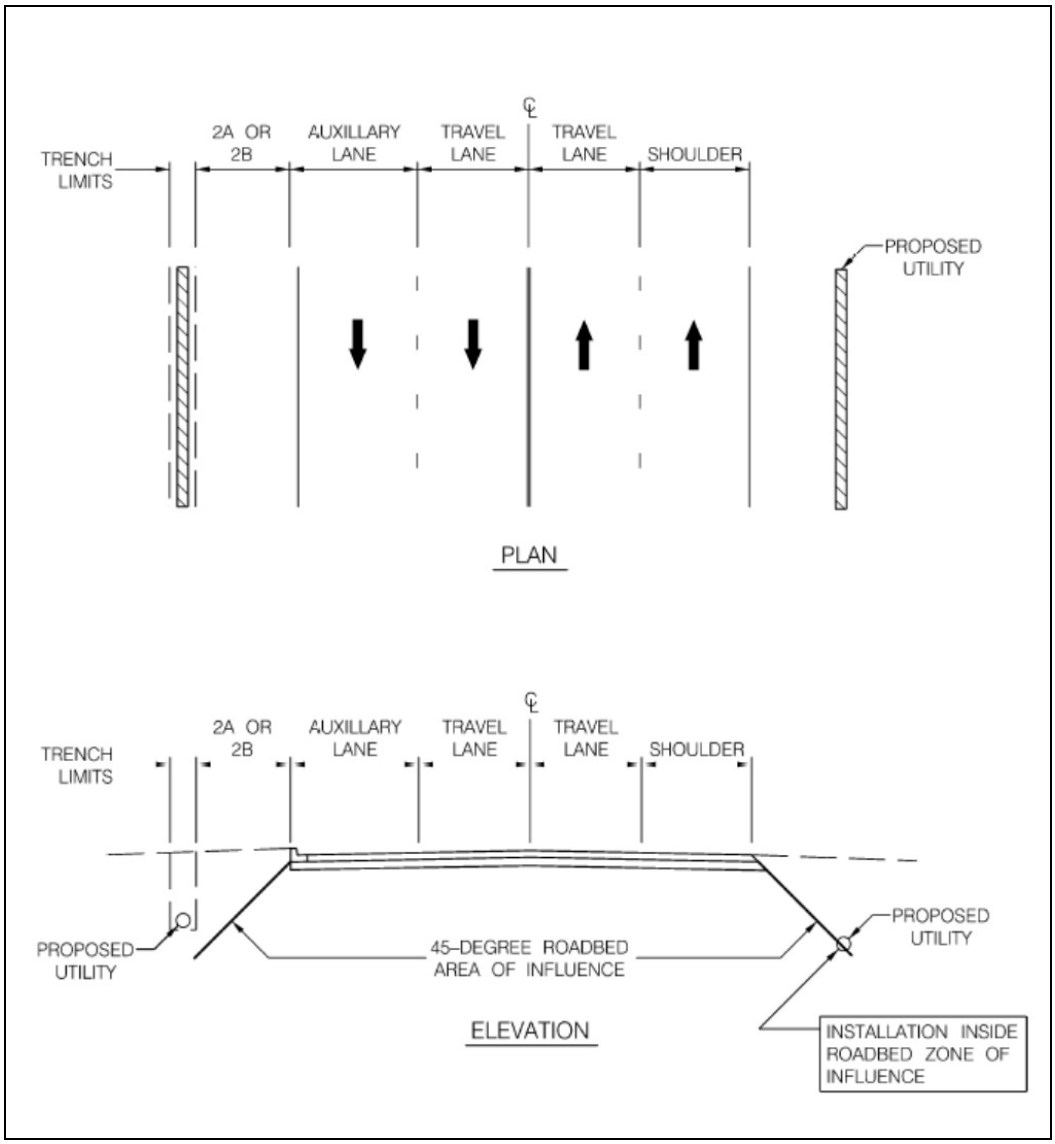
F) The 45-degree Zone of Influence for bridge structures is from the **bottom** of any edge of the bridge structure footing or foundation. Figure 9.04-1 – Bridge Structure Zone of Influence, illustrates these limits.

G) The 45-degree Zone of Influence for traffic structures is from the **top** of any edge of the traffic structure footing or foundation. Figure 10.04-1 – Traffic Structure Zone of Influence, illustrates these limits.

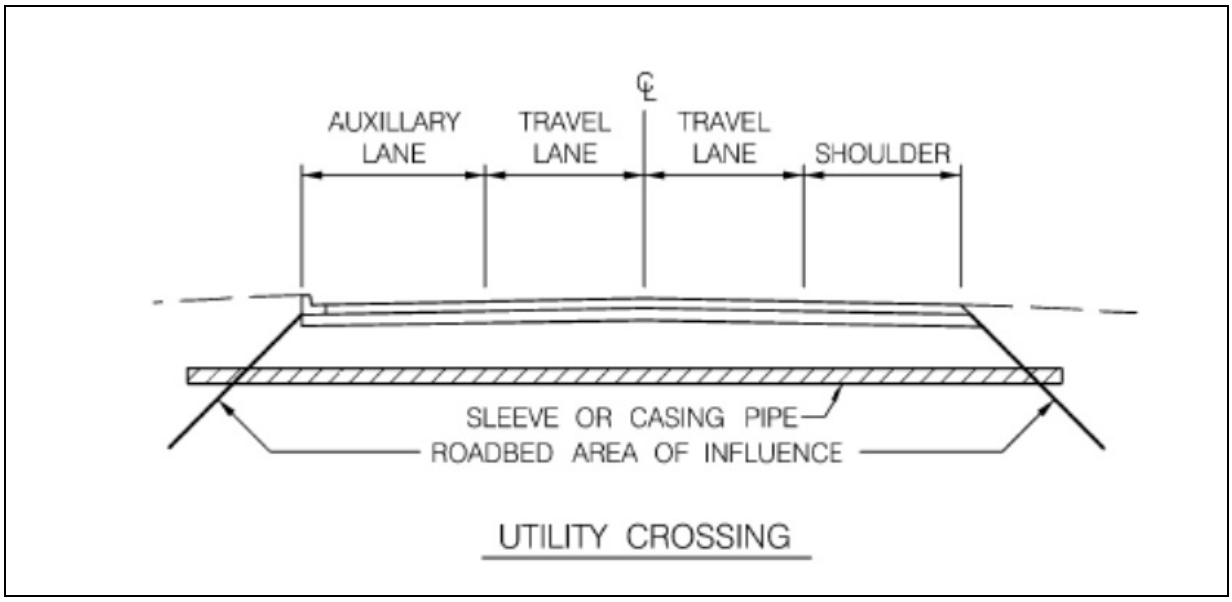
H) A trench box support may be used with the prior approval of the MDOT SHA.

4.07.02 Roadbed Area of Influence

A) The Roadbed Area of Influence is defined as the subsurface area located under the road and shoulder surface, between each shoulder point or back of curb; and continues transversely outward and downward from each shoulder point or back of curb on a 45-degree angle.



Roadbed Area Of Influence – Longitudinal Installation



Roadbed Area of Influence – Crossing

4.07.03 Open Cut

A) When utility companies, and others, make cuts into the pavement for utility installation or maintenance, they not only affect the pavement structure itself, but also MDOT SHA's storm drains and the other utilities which, with the pavement, are part of the transportation infrastructure. Utility cuts cause roadway pavements to deteriorate more quickly, and potentially affects MDOT SHA's storm drains and other utilities present in the highway.

B) Utility cuts into the roadway pavement almost always increase the roughness of a pavement structure in both the immediate and surrounding areas of a cut. Not only do cuts increase pavement roughness, but they also introduce discontinuities in the pavement structure. Both of these can cause the pavement's expected life span to decrease. There are two types of degradation that can occur - structural and functional - both of which can cause early failure of the pavement, depending on the user's definition of pavement failure.

1. **Structural failure** occurs when the pavement can no longer carry the loads for which it was designed without large deflections or deformations.
2. **Functional failure** occurs when the pavement no longer provides a smooth and safe riding surface for vehicles and passengers. A pavement can sometimes experience functional failure while remaining structurally sound. However, it is even less likely that a pavement that has experienced structural failure will remain functionally adequate.

C) Rough pavement is another aspect of pavement degradation that can quickly lead to structural failure, through a synergistic effect. Rough pavements can cause vehicles to bounce, thus creating greater loads on the pavement, which can lead to more rapid advancement of structural failure, and by consequence, further functional failure, or roughness.

D) Open cutting in existing roadways shall be permitted only when justified to the satisfaction of the appropriate District Engineer or their approved designee.

E) In those cases where an open cut is allowed, the pavement shall be restored in accordance with MDOT SHA's Standard Specifications For Construction And Materials and MDOT SHA's Book of Standards For Highway & Incidental Structures, Standard No. MD 578.01.

1. The pavement restoration may be modified at the discretion of the appropriate District Engineer or their approved designee.

F) Sheeting, shoring and/or bracing shall be required for any open cuts as required by MOSH, OSHA; and/or as determined by MDOT SHA in order to prevent failure of the embankments and to maintain safe access.

1. See Section 4.07.01 - Sheeting, Shoring and Bracing for further guidance.

G) The MDOT SHA can require resurfacing of the roadway up to a maximum of 200 feet on each side of a trench crossing a highway. This distance is a maximum and the appropriate District Engineer or their approved designee may approve resurfacing down to a minimum of 2 feet on each side of the excavation when road, traffic and excavation conditions permit.

H) When open cut is permitted longitudinally in the roadway, resurfacing to the width of the traveled lane(s) disturbed can be required. Some roadways may have to be resurfaced for their full width in order to provide a highway facility that is equivalent to the condition that existed prior to utility work. The appropriate District Engineer or their approved designee will designate the length and width of resurfacing taking into consideration the type and condition of the existing highway and traffic safety.

4.07.04 Trenching

A) Trenches shall be cut to have vertical faces, where soil and depth conditions permit, with a maximum width of outside diameter of the utility facility plus two feet.

B) Sheeting, shoring and/or bracing shall be required for any trenches within the Roadbed Area of Influence; within the Zone of Influence of any bridge or traffic structure; as required by MOSH and/or OSHA; and/or as determined by MDOT SHA in order to prevent failure of the embankments and to maintain safe access.

1. The roadside edge of trenches must be tightly sheeted and braced securely against skeleton sheeting on the opposite or far side of the trench; or when any other circumstances exist which require tight sheeting in the opinion of the MDOT SHA.

2. See Section 4.07.01 - Sheeting, Shoring and Bracing for additional information.

3. See Figure 9.04-1 – Bridge Structure Zone of Influence for additional information.

4. See Figure 10.04-1 – Traffic Structure Zone of Influence for additional information.

5. See Section 4.07.02 - Roadbed Area of Influence for further guidance. The Utility shall restore the structural integrity of any entrenched roadbed.

C) The Utility shall protect carrier pipes against any deformation which might cause leakage.

D) The Utility shall take precautions to prevent the trench from becoming a drainage channel or against drainage being blocked by the backfill.

4.07.05 Steel Plates

Whenever steel plates are placed within MDOT SHA rights-of-way, the Utility shall comply with the following provisions:

A) For non-emergency situations, the Utility shall notify the MDOT SHA at least 48 hours in advance of any steel plates being placed in the roadway.

B) Generally the Utility shall monitor and maintain the steel plates at least twice daily, seven (7) days a week including, but not limited to nights, weekends, and holidays until they are removed.

1. However, if agreed to by the MDOT SHA, the Utility may be allowed to monitor the steel plates on a less frequent basis.

C) Steel plates shall not be left in the roadway longer than 7 calendar days, without prior permission of the MDOT SHA.

D) Steel plates shall be installed as per MDOT SHA's Book of Standards For Highway & Incidental Structures, Standard No. MD104.01-85, Steel Plate – Method 1, Greater Than 40 mph; or Standard No. MD 104.01-86, Steel Plate – Method 2, Equal To Or Less Than 40 mph.

E) Steel plates shall meet the following requirements:

1. Steel shall conform to the current ASTM A36 standard.

F) For trench widths less than 5 feet (5'), steel plates shall be at least one-inch (1") thick

1. Steel plates shall be sized to effectively carry traffic with a maximum 1-inch (1") deflection.

G) For trench widths equal to or greater than 5 feet (5'), steel plates and support system shall be designed and stamped by a professional engineer licensed in the State of Maryland and approved by the MDOT SHA.

1. Steel plates and support system shall be sized to effectively carry traffic with a maximum 1-inch (1") deflection.

H) Steel plates shall be large enough to allow a minimum of one-foot (1') of bearing on all four sides of the pavement surrounding the excavation and securely anchored in place using minimum 6-inch (6") pins installed on all corners.

I) Steel plate bridging is prohibited on expressways and freeways.

J) In the event that multiple plates are required, the following shall be required:

1. Approach plates and ending plate shall be attached to the roadway by a minimum of one anchor pre-drilled into the corners of the plate and drilled a minimum 2-inches (2") into the pavement.

2. Subsequent plates shall be butted together and welded by placing at least three 12-inch (12") welds centered on each abutting plate. One weld is placed no more than one foot from each edge and one is placed in the center of the plates.

3. All welds shall be performed by an American Welding Society certified welder.

K) To minimize the hazard to the traveling public, the use of a bituminous concrete product shall be required on all exposed edges of the plates to ensure a smooth transition from the pavement to the surface of the steel plate.

1. The material shall be compacted to form ramps tapered from the height of the steel plate to the existing road surface.
2. Ramps shall have a maximum slope of 8.5% with a minimum 12-inch (12") taper to cover all edges of the steel plates.

L) For roadways with travel speeds greater than 40 mph, the steel plate shall be recessed.

1. The pavement shall be milled to a depth equal to the thickness of the plate and to a width and length equal to the dimensions of the plate.
2. Cold patch shall be used to ensure proper seating of plates and/or filling any gaps.
3. Plates shall be anchored using minimum 6-inch (6") pins.
4. The MDOT SHA, at its sole discretion, may require the Utility recess steel plate regardless of travel speed.

M) Whenever steel plates are placed within MDOT SHA rights-of-way, the Utility shall place Steel Plate signs in accordance with Section 11.07.01(A) Signing: Steel Plates.

N) Plates shall be removed from the MDOT SHA right-of-way within 24 hours once they are removed from the roadway. Plates shall never be left within the roadway, shoulders or any other area within the MDOT SHA right-of-way, which could jeopardize motorist safety.

O) Should an emergency condition occur that MDOT SHA forces are required to correct, the Utility shall be charged for any and all costs, including but not limited to; labor equipment, overtime, overhead, inspection, etc., associated with restoring the condition to a safe and acceptable level.

1. The Utility shall be responsible for any additional costs incurred by MDOT SHA for emergency repairs performed during Snow Emergencies.

4.07.06 Blasting

A. Blasting within MDOT SHA right-of-way is strictly prohibited without prior approval. To obtain authorization, a blasting plan (of type, charge, pattern and method) must be submitted for approval a minimum of 45 days in advance of the anticipated commencement of work. Blasting cannot begin until the blasting plan is approved and authorized by the MDOT SHA and all other appropriate agencies.

B. All blasting shall comply with MDOT SHA's Standard Specifications For Construction And Materials, Section 6.07- Use of Explosives.

C. A State of Maryland licensed blaster is required to perform all blasting work associated with the work to be accomplished under the terms of this permit. The Utility is required to furnish proof of a Maryland Blaster's License before beginning any blasting operation.

D. The Utility may be required to provide proof of additional insurance in an amount to be specified by the MDOT SHA prior to commencing any blasting activity.

E. The appropriate District Engineer or their approved designee must be notified 72 hours prior to beginning any blasting work.

F. All blasting is to be performed in complete compliance with the approved blasting plan.

G. Blasting is not to be performed within 100 feet of any residence or structure.

H. In addition to the requirements of this Section 4.07.06 – Blasting, any proposed blasting near a structure shall also comply with Section 9.08 - BLASTING NEAR STRUCTURES.

I. A thorough site inspection, including representatives of MDOT SHA, the Utility and other affected parties shall be conducted prior to the commencement of blasting. The existing conditions of all culverts, inlets, retaining walls, and other structures is to be fully documented using photographs and/or video tape supplied at the expense of the Utility. A copy of a complete set of this documentation is to be provided to the appropriate District Engineer or their approved designee prior to the commencement of blasting. A follow up inspection is to be performed upon the completion of blasting to identify any new damage to existing facilities. All damage to existing facilities shall be repaired to the complete satisfaction of the MDOT SHA at the sole expense of the Utility. All necessary repair or replacement work is to begin immediately and be completed as soon as practical.

J. The Utility is solely responsible to resolve to the complete satisfaction of the MDOT SHA all damage claims resulting from any activity associated with blasting performed under this permit. The Utility shall provide all required repair or replacement of facilities damaged by blasting operations at no cost to the MDOT SHA.

K. All shots shall be matted to control flying rock and debris so as to prevent damage to persons or structures.

L. Equipment used for drilling blast holes shall use a positive means of dust control.

M. Seismic readings may be required to monitor blasting operations. A copy of readings indicating peak particle velocities shall be made available to a representative of the MDOT SHA after each shot when required.

N. Blasting shall not be performed closer than 50 feet from any water, gas, sewer, cable, or conduit unless said facilities have been completely exposed, definitely located and suitably backfilled prior to blasting in strict accordance with the specific requirements of the representative utility agencies. In no case will blasting be permitted closer than two feet from any utility facility ten inches or smaller in diameter, and no closer than five feet from any utility facility larger than ten inches in diameter.

O. All possible caution is to be exercised to ensure that drilling and blasting operations minimize overbreak and blast damage to adjacent unexcavated ground.

P. All blasting is to be carefully balanced and controlled to provide a uniform distribution of charge that will fracture the rock so that it may be excavated to the required contours without fracturing rock beyond the excavation limits. Modify the blasting round as necessary to achieve the best obtainable results and to keep the air blast over pressure, vibrations and noise within the limits herein specified. Exercise all possible care in drilling and blasting operations to minimize overbreak and blast damage of adjacent unexcavated ground. It shall be the Utility's responsibility to produce a satisfactory excavated surface by determining the proper relationships of the factors of burden, spacing, depth of charge, amount and type of explosive, hole size and delay pattern, and other necessary considerations to achieve the required results.

Q. Controlled blasting is a method used to remove rock in which the various elements of the blast, hole size, depth, spacing, burden, charge size, explosive charge weight per delay, distribution, delay sequence, are carefully balanced and controlled to provide a distribution of the charge that will fracture the rock, so it may be excavated to the required contours and minimize overbreak and fracturing of the rock beyond the contour line. Smooth wall blasting, pre-splitting, cushion blasting and line drills are examples of operation included in the term "controlled blasting".

R. The Utility shall be responsible for providing material to replace broken rock that is unsuitable for trench backfill use.

S. In the event that air blast pressure, vibration, noise, flying debris, or overbreakage exceed specified limits, all blasting operations are to be immediately suspended until a modified blasting plan is submitted and approved.

4.07.07 Test Holes & Test Pits

A. Frequently it is necessary to determine the location and/or elevation of underground structures and utilities by the use of test hole or test pit excavation prior to designing a project or initiating excavation operations for the installation of a proposed facility.

1. While there are a variety of methods of excavating to test hole or test pit facilities, test holes and test pits within MDOT SHA right-of-way shall be kept to the minimum required for satisfactory completion of the work.

2. A Test Hole is a small excavation used to expose underground utilities to ascertain the horizontal and vertical location and/or other attributes of the facility used in the design of a project.

a) All test holes performed in pavement areas shall not exceed a12-inch by 12-inch area unless otherwise approved by the MDOT SHA.

i. The facility or structure shall be exposed by vacuum excavation unless otherwise approved by the MDOT SHA.

3. A Test Pit is an excavation made to examine the subsurface conditions and/or to ascertain the horizontal and vertical location of underground utility facilities on a construction site. Test pits are dug prior to the actual construction.

a) The dimensions of test pits depend largely upon the depths up to which the excavation is to be made, generally 3-feet to 4-feet square or rectangle.

i. All test pit excavations shall be kept to the minimum required for satisfactory completion of the work.

B. All test holes and/or test pits performed within MDOT SHA right-of-way shall be in accordance with Standard Specifications For Construction And Materials, Section 205 - Test Pit Excavation, Section 210 – Tamped Fill, and Standard Specifications for Subsurface Explorations.

C. Test holes and/or test pits shall be of the size, depth and location as approved by the MDOT SHA in accordance with Title 12 (Miss Utility) location requirements.

D. All damaged paving shall be repaired or replaced in kind as soon as practicable and to the satisfaction of the MDOT SHA.

1. The Utility shall backfill the test holes and/or test pits in accordance with Section 4.08.01 – Backfilling.
2. At the discretion of the District Utility Engineer, the Utility shall:
   a) Temporarily restore the pavement with a minimum of 3" of cold patch placed into the excavated area in accordance with MDOT SHA's Standard Specifications For Construction And Materials, Section 924 - Cold Patch Material; or
      i. The MDOT SHA approves the use of cold patch material which requires water (as per the manufacturer's directions) to activate the product.
   b) Permanently restore the pavement in accordance with MDOT SHA's Book of Standards For Highway & Incidental Structures, Standard No. 578.01; or
   c) Permanently restore the pavement in accordance with MDOT SHA's Standard Specifications For Construction And Materials, Section 505 - Hot Mix Asphalt Patches; or
   d) Restore the test holes by another method as approved by MDOT SHA.

E. Repairs shall be completed within 48 hours unless otherwise approved by the MDOT SHA.

4.08 RESTORATION

Any and all MDOT SHA right-of-way, structure and/or facility affected by any activity performed by the Utility shall be restored to its original condition or better upon completion of work.

4.08.01 Backfilling

A) The Utility shall backfill all excavated areas as per the Complete Authorized Utility Permit, MDOT SHA's Standard Specifications For Construction And Materials, and/or as directed by the MDOT SHA.

B) From the highway viewpoint for trench and backfill construction, the integrity of the pavement structure, shoulders, and embankment slopes are of primary concern.

1. The Utility shall backfill all excavated areas with the material excavated.
2. In the event soils removed from excavations are not suitable as backfill, the Utility shall use select backfill material.

C) Backfill shall be accomplished in three stages: bedding, side-fill (from bedding to top of pipe or facility), and over-fill (top of pipe or facility to top of sub-grade)

1. **Bedding**
   a) Bedding shall be in accordance with the requirements of MDOT SHA's Standard Specifications For Construction And Materials, Section 303.03.02 - Bedding.
   b) Bedding shall be provided to a depth of six inches or half the diameter of the pipe or facility, whichever is less.
   c) The bottom of the trench shall be prepared to provide the pipe or facility with uniform bedding throughout the length of the installation.

d) Bedding shall consist of granular material free of lumps, clods, stones, and frozen material.

e) Bedding shall be graded to a firm but yielding surface without abrupt change in bearing value.

f) Unstable soils and rock ledges shall be excavated from the bedding zone and replaced with suitable material or as directed by the MDOT SHA.

2. Sidefill

a) Sidefill shall consist of granular material deposited in 6 inch layers and mechanically tamped in accordance with the requirements of MDOT SHA's Standard Specifications For Construction And Materials, Section 204 - Embankment and Section 210 - Tamped Fill to the top of pipe or facility.

b) Consolidation by saturation or ponding is not permitted.

3. Overfill

a) Overfill shall consist of granular material deposited in 6 inch layers and mechanically tamped in accordance with the requirements of MDOT SHA's Standard Specifications For Construction And Materials, Section 204 - Embankment and Section 210 - Tamped Fill.

b) Consolidation by saturation or ponding shall not be permitted.

c) Sections where the backfilling is located within roadways, shoulders, or other paved areas, the overfill shall be backfilled in to within one foot of the top of the sub-grade; the remaining depth of the trench shall be backfilled with thoroughly compacted crusher run stone or gravel at the option and approval of the appropriate District Engineer or their approved designee.

D) Backfilling and methods of compaction shall be adapted to achieve prompt restoration of traffic.

1. The Utility may backfill excavations by alternate means such as flowable fill if approved by the MDOT SHA.

a) For areas approved to be backfilled with flowable fill, the Utility shall place and cure the Controlled Low Strength Material as directed by the MDOT SHA and in accordance with MDOT SHA's Standard Specifications For Construction And Materials, Section 314 - Flowable Backfill.

E) Additional cutback of roadway base and surface and transitioning of excavated shoulders to minimize later development of sag in the grade of the pavement over the excavation shall be as directed by the MDOT SHA.

4.08.02 Temporary Restoration

A) The Utility shall immediately repair all disturbed areas upon completion of backfilling excavations.

1. At the sole discretion of the MDOT SHA, the temporary repair disturbed areas may be allowed; otherwise all repairs shall be permanent.

B) Temporary repair of areas outside the paved sections shall be restored to existing grades and materially to its original condition in accordance with Section 4.08.05 - Roadside Restoration after backfilling.

1. The extent of repairs or replacement shall be determined at the sole discretion of the MDOT SHA.

2. Any disturbed grass areas shall be restored (topsoiled, seeded, fertilized, mulched, anchored, etc.) in accordance with MDOT SHA's Standard Specifications For Construction And Materials, Category 700 – Landscaping.

C) Temporary repair of shoulder areas after backfilling, if allowed by MDOT SHA, shall consist of a minimum of 3" of cold patch placed in to the excavated shoulder area and mechanically compacted as directed by the MDOT SHA.

D) The MDOT SHA may, at its discretion, allow a temporary patch of roadway area for a short period of time, not to exceed thirty (30) days unless agreed to in writing between the Permittee and the MDOT SHA as long as the patching remains acceptable for driving conditions.

1. The period of time subject to weather conditions allowing the work to be completed.

2. Temporary repair of bituminous concrete areas after backfilling shall consist of a minimum of 3" HMA placed into the excavated roadway area and mechanically compacted or as directed by MDOT SHA.

4.08.03 Roadway & Shoulder Repair and Restoration

A) General

1. The Utility shall permanently repair all roadway and shoulder areas (including intersecting roads and streets) in accordance with MDOT SHA's Book of Standards For Highway & Incidental Structures and Standard Specifications For Construction And Materials.

a) Standard No. MD 578.01 is a minimum guideline only and MDOT SHA reserves the right to change permit repair specifications to suit any changes that may occur on site.

2. Final pavement restoration shall occur within 30 days of the completion of temporary pavement repairs unless agreed to in writing between the Permittee and the MDOT SHA.

3. Permanent repair of shoulder and roadway areas excavated by the Utility shall consist of the removal of any temporary repairs placed and must extend a minimum of two feet beyond the limits of the excavation on all sides.

a) All pavement repairs shall be as determined by the MDOT SHA.

b) Any pavement repair or restoration over 1000' in length shall require pavement surface profile testing.

i. The Utility shall contact the MDOT SHA's Office of Material Technology to coordinate the pavement surface profile testing.

ii. Any pavement repair or restoration which fails the pavement surface profile testing shall be milled and overlaid in accordance with Section 4.08.03(B) – Milling and Overlay at the sole expense of the Utility.

4. The Utility will be responsible for a period of one year for any settlement of any repair. At the discretion of the MDOT SHA, the area of settlement must be cut out and replaced to match existing profile.

B) Milling and Overlay

1. At the sole discretion of the MDOT SHA, the Utility may be required to mill and overlay pavement surfaces disturbed by the Utility's activities.
   - **a)** The extent of any required mill and overlay shall be determined by the MDOT SHA.
2. Exposed utility surface structures in milled areas are to be protected around their entire circumference with a minimum taper of two feet of a bituminous concrete product if the milled area is to be opened to traffic before the milled area is repaved.
3. Milled surfaces shall be resurfaced within seven days.
4. Traffic markings and symbols are to be replaced in milled and resurfaced areas prior to the reopening of pavement to traffic.
   - **a)** Restriping of these areas shall be completed immediately upon resurfacing
   - **b)** All costs shall be entirely at the Utility's expense.

C) Roadways

1. **Portland Cement Concrete Roadway:** All concrete pavement disturbed shall be repaired with at least a six-foot length of reinforced concrete patch or to the length required by MDOT SHA's Book of Standards For Highway & Incidental Structures, Standard MD 578.01 and placed in accordance with Standard Specifications For Construction And Materials, Section 522 – Portland Cement Concrete Pavement Repairs. Curing of the concrete patch will be in compliance with MDOT SHA's Specifications.
   - **a)** In the event the edge of the trench is within six feet of a construction joint, the reinforced concrete patch must be extended to the construction joint. All trenches must be sawed full depth with a concrete saw. The roadway openings must be compacted as specified under Section 4.08.01 Backfilling.
2. **Bituminous Concrete Roadway:** All bituminous concrete pavement disturbed is to be repaired in accordance with MDOT SHA's Book of Standards For Highway & Incidental Structures, Standard No. MD 578.01 and/or as directed by the MDOT SHA. The concrete patch shall be overlaid with HMA, placed and thoroughly compacted, in accordance with MDOT SHA's Standard Specifications For Construction And Materials, Section 504 – Hot Mix Asphalt Pavement and Section 505 - Hot Mix Asphalt Patches.

D) Shoulder Areas

1. **Portland Cement Concrete Shoulders:** All concrete pavement disturbed shall be repaired with at least a six-foot length of reinforced concrete patch or to the length required by MDOT SHA's Book of Standards For Highway & Incidental Structures, Standard MD 578.01 and placed in accordance with Standard Specifications For Construction And Materials, Section 522 – Portland Cement Concrete Pavement Repairs. Curing of the concrete patch will be in compliance with MDOT SHA's Specifications.
   - **a)** In the event the edge of the trench is within six feet of a construction joint, the reinforced concrete patch must be extended to the construction joint. All trenches must be sawed full depth with a concrete saw. The roadway openings must be compacted as specified under Section 4.08.01 - Backfilling.

2. **Bituminous Concrete Shoulders:** All bituminous concrete pavement disturbed is to be repaired in accordance with MDOT SHA's Book of Standards For Highway & Incidental Structures, Standard No. MD 578.01 and/or as directed by the MDOT SHA. The concrete patch shall be overlaid with HMA, placed and thoroughly compacted, in accordance with MDOT SHA's Standard Specifications For Construction And Materials, Section 504 – Hot Mix Asphalt Pavement and 505 - Hot Mix Asphalt Patches.

   a) **Full Depth Bituminous Concrete Shoulders:** At the sole discretion of the MDOT SHA, pavement repairs to full depth bituminous concrete shoulders may be composed of a variable depth HMA base covered with 2 inches of HMA surface. The total thickness of HMA used for shoulder repairs must be equal to or greater than the thickness of the existing shoulder pavement.

3. **Chip Seal Surface Treated Shoulders:** All Chip Seal Surface Treated Shoulders disturbed shall be replaced with 12 inch dense graded aggregate base, placed and compacted in two horizontal lifts of thickness not exceeding six inches and graded to match the existing shoulder slope. The Chip Seal Surface Treatment shall be performed in accordance with MDOT SHA's Standard Specifications For Construction And Materials, Section 503 – Chip Seal Surface Treatment and as directed by MDOT SHA. The Utility shall maintain the disturbed shoulder area for a minimum of six months after completion of all work.

4. **Dense Graded Aggregate Shoulders:** All Dense Graded Aggregate Shoulders disturbed shall be replaced with 12 inch dense graded aggregate base, placed and compacted in two horizontal lifts of thickness not exceeding six inches and graded to match the existing shoulder slope. The material must have a dual treatment of calcium chloride consisting of one pound per square yard each treatment, with treatments 14-90 days apart as required in the opinion of MDOT SHA. The Utility shall maintain the disturbed shoulder area for a minimum of six months after completion of all work.

4.08.04 Private Entrances

A) The Utility shall replace any existing private entrance aprons damaged by the Utility's activities.

B) Private entrance aprons shall be replaced in accordance with MDOT SHA's Guidelines for Residential Entrances to State Highways and Residential Permit Application Package.

C) Commercial entrances damaged by the Utility's activities shall be replaced in accordance with the Complete Authorized Utility Permit or as directed by the MDOT SHA

D) Private entrances in areas with existing sidewalks and concrete curb & gutter; or existing concrete entrances shall be replaced completely in accordance with MDOT SHA's Book of Standards For Highway & Incidental Structures, Standard No. MD 630.01, Standard No. MD 630.02 or Standard No. MD 630.03, depending on applicability.

1. Portland cement concrete entrances shall be constructed using Mix No. 3 concrete on a suitable sub-base or as directed by the MDOT SHA.

E) Private entrances in areas without sidewalk and concrete curb & gutter, except existing concrete entrances, shall consist of 4½ inches bituminous concrete (3-inch base, 1½ inch surface) on 6 inches crusher run stone or 6 inches selected backfill.

1. Modifications to suit existing site conditions and locale may be made by MDOT SHA.

4.08.05 Roadside Restoration

A) General

1. The Utility shall repair, restore, or replace anything disturbed or damaged, including but not limited to all curbs, medians, gutters, drains, fences, sidewalks, steps, rails, walls, signs, structures, crosswalks, mailboxes, etc., as a result of any of the Utility's activities to the complete satisfaction of the MDOT SHA.
2. The MDOT SHA strives to be a good neighbor to the citizens along state highways. The Utility shall address any complaints by adjacent property owners. The Utility may be required to repair, restore, or replace anything disturbed or MDOT SHA right-of-way damaged as a result of any of the Utility's activities, if directed by the appropriate District Engineer or their approved designee.

B) Traffic Barriers

1. Any removal, adjustment or relocation of traffic barriers, posts, anchors, traffic barrier delineators, end treatments, etc. is strictly prohibited except as specifically authorized by the Complete Authorized Utility Permit.
2. Traffic barriers shall be replaced in accordance with MDOT SHA's Book of Standards For Highway & Incidental Structures, Category 6 – Shoulders; Standard Specifications For Construction And Materials, Section 604 - Concrete Traffic Barriers, Section 605 - Metal Traffic Barriers, and Section 605 - Traffic Barrier End Treatments; and Guidelines for Traffic Barrier Placement and End Treatment Design to meet latest approved standards NCHRP 350 or Manual for Assessing Safety Hardware (MASH).

C) Traffic Control Facilities & Devices

1. The removal, adjustment or relocation of signs, delineators, markers, crosswalks, other traffic control facilities or devices is strictly prohibited except as specifically authorized by the Complete Authorized Utility Permit.
2. MDOT SHA traffic control facilities or devices shall not be removed until immediately prior to the utility activity requiring removal and shall be replaced in their original locations immediately upon completion of said utility activity.
3. MDOT SHA traffic control facilities or devices disturbed or damaged by the Utility's activities shall be repaired, replaced or otherwise restored to the satisfaction of the MDOT SHA in accordance with MDOT SHA's Book of Standards For Highway & Incidental Structures; Standard Specifications For Construction And Materials; and Maryland Manual on Uniform Traffic Control Devices (MdMUTCD)
4. Delineators removed for construction shall be replaced to their original height and position upon the immediate completion of activities in accordance with MDOT SHA's Book of Standards For Highway & Incidental Structures, Standard Nos. MD 665.01 thru MD 665.06; and Maryland Manual on Uniform Traffic Control Devices (MdMUTCD).

D) Curbs and Combination Curb & Gutter

1. Any existing curbs and/or combination curb & gutters disturbed shall be replaced to the limits as indicated for concrete roadway repair with the exception that in the event the edge of the trench is within four feet (4') of a construction joint the concrete curb shall be continued to said construction joint and must conform with the existing curbs and/or combination curb & gutters and shall be constructed in accordance with MDOT SHA's Book of Standards For Highway & Incidental Structures and Standard Specifications For Construction And Materials.
2. Existing concrete curb or combination curb and gutter shall be replaced using Mix No. 3 to its original condition in accordance with the MDOT SHA's Standard Specifications For Construction And Materials, Section 603- Sidewalks and MDOT SHA's Book of Standards For Highway & Incidental Structures, Standard Nos. MD 620.02, MD 620.02-1 and MD 620.03 as appropriate .
3. Existing bituminous curb shall be replaced to its original condition in accordance with the MDOT SHA's Standard Specifications For Construction And Materials, Section 603- Sidewalks and MDOT SHA's Book of Standards For Highway & Incidental Structures, Standard No. MD 615.01.
4. Any existing curbs and/or combination curb & gutters disturbed shall be replaced in compliance with MDOT SHA's ADA Policy.
   a) Refer to Section 2.06 - ADA (AMERICAN WITH DISABILITIES ACT) REQUIREMENTS for further guidance.

E) Sidewalks

1. Permanent repairs to concrete sidewalk shall consist of removal of the entire blocks of concrete sidewalk affected and the entire area replaced with Mix No. 3 concrete (if applicable, type will be specified in Individual Work Order Permit), 5-inches thick and finished to a true grade and alignment of existing sidewalk - scored and blocked so as to match the existing sidewalk.
2. All work and materials shall be in accordance with the requirements of the MDOT SHA's Standard Specifications For Construction And Materials, Section 603- Sidewalks and MDOT SHA's Book of Standards For Highway & Incidental Structures, Standard Nos. MD 655.01 thru MD 655.21.
   a) The Utility shall contact the appropriate local government or municipal Department of Public Works to obtain any necessary permits for all work involving the disturbance of sidewalks.
3. Any existing sidewalks disturbed shall be replaced in compliance with MDOT SHA's ADA Policy.
   a) Refer to Section 2.06 - ADA (AMERICAN WITH DISABILITIES ACT) REQUIREMENTS for further guidance.

F) Drainage Structures

1. All drainage facilities must function, not only after work is completed, but while work is in progress in accordance with MDOT SHA's Standard Specifications For Construction And Materials, Section 201.03.07 – Drainage.

2. Storm drain facilities and concrete ditches damaged during construction shall be reconstructed "in kind" in accordance with MDOT SHA's Standard Specifications For Construction And Materials, Category 300 - Drainage and MDOT SHA's Book of Standards For Highway & Incidental Structures, Category 300 - Drainage.
3. Disturbed, unpaved drainage ditches shall be restored to their original condition by resodding or seeding and mulching as determined by the MDOT SHA, and shall be left in an orderly condition in accordance with MDOT SHA's Standard Specifications For Construction And Materials, Category 300 - Drainage and MDOT SHA's Book of Standards For Highway & Incidental Structures, Category 300 - Drainage.
4. The Utility shall avoid and minimize construction impacts to wetlands and waterways and shall restore affected areas to their preconstruction condition.
   a) Stream beds shall be left free of debris.
   b) Refer to Section 5.04.02 - Wetlands and Waterways Permit & Mitigation and Section 5.05.02 - Environmental Area Protection for further guidance.

G) Fences

1. Fences shall be replaced in accordance with the MDOT SHA's Standard Specifications For Construction And Materials, and MDOT SHA's Book of Standards For Highway & Incidental Structures.
2. All fence openings shall be completely restored prior to the end of each working shift.

H) Landscaping

1. The Utility shall take all necessary steps during construction to minimize erosion and siltation onto the right-of-way.
   a) The Utility shall comply with MDOT SHA's Standard Specifications For Construction And Materials, Section 101.03.01 - Erosion and Sediment Control and Section 308 - Erosion and Sediment Control
2. Topsoil removed during excavation shall be stockpiled and subsequently replaced to a depth of 4 inches.
3. The extent of repairs or replacement shall be determined at the sole discretion of the MDOT SHA.
4. Any disturbed grass areas shall be restored (topsoiled, seeded, fertilized, mulched, anchored, etc.) in accordance with MDOT SHA's Standard Specifications For Construction And Materials, Category 700 – Landscaping.
5. All desirable trees, shrubs, and other plant materials shall be replaced to the satisfaction of the MDOT SHA.

CHAPTER 5

ENVIRONMENTAL

5.01 GENERAL

This chapter explains design guidance and responsibilities of the MDOT SHA Office of Environmental Design (OED) during review of a Utility Permit application, and during construction under a Utility Permit.

5.01.01 Responsibilities and GIS Tool Link

A) OED will review and provide comments only when Utility Permit projects impact any of the review concerns of Table 5.01 - Review Concerns that Trigger OED Review.

B) OED review concerns may be identified by using the 'OED Permit Reviewer GIS Tool' through this link: GIS Tool Link https://arcg.is/18aW11

Review Concerns that Trigger OED Review		
Review Concern	**Utility Manual**	**Action by Utility Engineer**
OED Managed Landscape Assets	5.04.01	Submit review materials to OED as soon as feasible after review concern is identified.
OED MS4 / TMDL Assets	5.04.02	Submit review materials to OED as soon as feasible after review concern is identified.
OED Mitigation Sites	5.04.03	Submit review materials to OED as soon as feasible after concern is identified.
Chesapeake & Atlantic Coastal Bays Critical Areas	5.04.04	Submit review materials to OED as soon as feasible after review concern is identified.

Table 5.1 - Review Concerns that Trigger OED Review

C) Utility staff are responsible for the routine review and approval of MDOT SHA Utility Permit submittals that involve landscape impacts. Except as described in Section 5.04.04 Chesapeake & Atlantic Coastal Bays Critical Areas, coordination between the Utility Engineer and OED is not necessary to determine mitigation or approve landscape planting design for a Utility Permit.

5.01.02 Other Required Permits

A) The 'Environmental Guide for District, Access, and Utility Permit Applicants' and other guidance documents described in Section 5.04.02 OED MS4 / TMDL Assets provide guidance for determining mitigation and developing landscape restoration plans that are acceptable to MDOT SHA when Utility Permit projects impact typical shoulder areas, roadside trees and brush of SHA property.

B) Conformance with design and mitigation guidance of the 'Environmental Guide' is generally sufficient to satisfy MDOT SHA requirements and to facilitate permit issuance by the Maryland Department of Natural Resources - Forest Service as well as the Maryland Department of the Environment, the Critical Area Commission for the Chesapeake & Atlantic Coastal Bays, the United State Army Corps of Engineers, and other permitting agencies. However, the aforementioned agencies and others may impose other standards or other design requirements as a condition for approval or permit issuance of their agencies.

C) Coordination for the issue of other permits that may be necessary for construction under a Utility Permit is the responsibility of the Utility Permit applicant in cooperation with the Utility Engineer. OED will not provide guidance regarding the design of Utility Permit projects to meet requirements established by other agencies except when the project design involves OED review concerns described in Section 5.04.04 Chesapeake & Atlantic Coastal Bays Critical Areas.

5.02 ENVIRONMENTAL GUIDANCE DOCUMENTS

A) All utility environmental design and construction compliance shall be in complete conformance with specifications, standards, provisions and policies of Section 1.08 - GENERAL GUIDANCE DOCUMENTS.

B) In addition to the documents referenced in the previous paragraph, all utility environmental design and construction compliance shall be in complete conformance with, and particular attention to, the specifications, standards, provisions and policies of the following agencies, organizations, institutes, and publications as applicable to the type of utility facility and/or type of work:

- Standard Specifications For Construction And Materials
- Environmental Guidelines for Construction Activities
- MDOT SHA Landscape Estimating Manual
- MDOT SHA Landscape Design Guide
- MDOT SHA Preferred Plant List
- SHA PRD Part A - Sediment and Stormwater Guidelines
- SHA PRD Part B – Sediment and Stormwater Administrative Procedures

C) Whenever MDOT SHA's Standard Specifications For Construction And Materials is referred to in this Chapter or this Utility Manual, the latest version of the Supplemental Specifications and Provisions shall be reviewed to ensure the most current specification is used.

D) The MDOT SHA's website Environment and Community can provide additional guidance on the following:

- Cultural Resources Protection
- Community Improvement
- Cleaner, Greener Practices & Initiatives
- Protecting & Enhancing the Natural Environment

5.03 OED DESIGN ASSISTANCE

5.03.01 Paper Copies

Refer to Table 5.01 - Review Concerns that Trigger OED Review. OED will provide a coordinated response of review comments when paper plans, specifications and engineers estimates are submitted to the following address:

Office of Environmental Design
707 N. Calvert St. Mailstop C-303
Baltimore, MD 21202

5.03. 02 Email & Links

Refer to Table 5.01 - Review Concerns that Trigger OED Review. In lieu of paper copies, OED will provide comments when electronic copies of plans, specifications and engineer's estimates are sent as email attachments, or when emails with review document links are sent to the following email address: oedprojectreview@sha.state.md.us

5.04 OED REVIEW CONCERNS

OED will provide review comments as described below when construction is expected to involve review concerns described in Sections 5.04.01 thru 5.04.04 of this Chapter 5 Environmental. If no review concerns are identified, then review materials are not to be submitted to OED. The following link opens the 'OED Permit Reviewer GIS Tool' that is used to determine whether proposed construction will require OED review: GIS Tool Link https://arcg.is/18aW11

5.04.01 OED Managed Landscape Assets

A) These include 3 types of assets that are identified in the OED Permit Reviewer GIS Tool: Tree Groups, Plant Beds, and Turf Areas. These assets are maintained under contract by OED on right of ways, facilities, rest areas, gateways, monuments, and other MDOT SHA property.

B) When a permit project will impact any OED managed landscape assets, review documents will be sent by the Utility Engineer to OED as soon as feasible after review concerns are identified. In response, OED will determine requirements for mitigation and restoration before issuance of the MDOT SHA permit.

5.04.02 OED MS4 / TMDL Environmental Assets

A) These include 6 types of assets: Part 1 Outfall Stabilization assets and Stream Restoration assets, as well as Part 2 Tree Planting assets, Stormwater Control Structure assets, Retrofit assets, and Pavement Removal assets. These assets are maintained and tracked by OED on MDOT SHA property and rights of ways.

B) When a permit project will impact any OED MS4 / TMDL environmental assets, review documents will be sent by the Utility Engineer to OED as soon as feasible after review concerns are identified. In response, OED will determine requirements for mitigation and restoration before issuance of the MDOT SHA permit.

5.04.03 OED Mitigation Sites

A) These include Mitigation Sites and Reforestation Sites. These sites are maintained and tracked by OED on MDOT SHA property and rights of ways.

B) When a permit project will impact OED Mitigation Sites, review documents will be sent by the Utility Engineer to OED as soon as feasible after review concerns are identified. OED will determine requirements for mitigation and restoration before issuance of the MDOT SHA permit.

5.04.04 Chesapeake & Atlantic Coastal Bays Critical Areas

A) These include Critical Areas on MDOT SHA property and rights of ways.

B) When a permit project is located in Chesapeake & Atlantic Coastal Bays Critical Areas, review documents will be sent by the Utility Engineer to OED as soon as feasible after review concerns are identified. In response, OED will notify the Critical Area Commission for the Chesapeake & Atlantic Coastal Bays. After sending notification to the Commission, OED will have no further role.

5.05 OED CONSTRUCTION ASSISTANCE

5.05.01 Required Certifications

A) OED will provide assistance to ensure conformance with SHA Standard Specifications for Construction and Materials during construction when requested by District Utility staff.

B) Send requests for OED assistance with documents or links to any supplemental materials which may be necessary to: oedprojectreview@sha.state.md.us

CHAPTER 6

UTILITY ACCOMMODATION

6.01 GENERAL

As implied under §8-204 (c) of the Annotated Code of Maryland, Transportation Article, the MDOT SHA is required to control utility use of right-of-way on MDOT SHA rights-of-way so as to preserve the operational safety, functionality, and aesthetic quality of the highway system. Refer to Section 1.05.01 - Maryland Law – MDOT SHA for additional information.

However, §8-646 of the Annotated Code of Maryland, Transportation Article permits certain non-highway uses of the right-of-way which are found to be in the public interest provided such uses do not impair the highway or interfere with the free and safe flow of traffic thereon. These proposed non-highway uses cannot be of a nature that would negate the general requirement regarding the adequacy of the right-of-way. Therefore, it is implicit that there must be adequate space available to locate the utility facilities in a manner that does not interfere with the safe and efficient operations of the highway.

Consequently, when the MDOT SHA intends to permit utilities to use and occupy MDOT SHA's highway right-of-way, such potential use should be a consideration in determining the extent and adequacy of the right-of-way needed for future projects. Failure to recognize the impact of such use, as well as other uses on private property located adjacent to the MDOT SHA highway right-of-way may affect the safe and efficient operations of the highway and may result in right-of-way which is inadequate to meet the needs of the highway and the traveling public.

Therefore, the issue of adequate accommodation of utilities is a legitimate consideration in accommodating utility installations on MDOT SHA rights-of-way and the potential impacts to future highway projects. In order to preserve the operational safety, functionality, and aesthetic quality of the highway system, the Utilities shall:

A) Utility installations shall be located to minimize need for later adjustment to accommodate future highway improvements and to permit access for servicing such lines with minimum interference to highway traffic.

B) Utility installations shall be located in accordance with the control zone guidelines.

C) Longitudinal installations shall be located on a uniform alignment and grade as near as practicable to the right-of-way line so as to provide a safe environment for traffic operation and shall preserve space for future highway improvements or other utility installations.

D) Utility line crossings of the highway shall be normal to the highway center line to the extent feasible and practical. Crossings should be made on a true line and grade. Crossings entering the right-of-way at an angle greater than forty-five degrees from normal shall be considered longitudinal location except crossings within public road intersections.

E) In all cases, full consideration shall be given to visual quality, sound engineering principles, and overall economic aspects.

F) The MDOT SHA may restrict the number of utility service connections, and require the placement of one or more distribution lines in lieu thereof.

6.02 GUIDANCE DOCUMENTS for UTILITY ACCOMMODATION

A) All utility accommodation shall be in complete conformance with specifications, standards, provisions and policies of Section 1.08 - GENERAL GUIDANCE DOCUMENTS.

B) In addition to the documents referenced in the previous paragraph, all utility accommodation shall be in complete conformance with, and particular attention to, the specifications, standards, provisions and policies of the following agencies, organizations, institutes, and publications as applicable to the type of utility facility and/or type of work:

- FHWA Program Guide (FAPG): Utility Relocation and Accommodation On Federal-Aid Projects
- A Policy on the Accommodation of Utilities Within Freeway Right-of-Way
- A Guide for Accommodating Utilities Within Highway Right-of-Way
- Book of Standards For Highway & Incidental Structures
- National Electric Code (NEC)
- National Electric Safety Code (NESC)
- Standard Specifications For Construction And Materials
- Supplemental Specifications and Provisions
- MDOT SHA's Accessibility Guidelines for Pedestrian Facilities along State Highways
- MDOT SHA Utility Manual
- FHWA Guidance on Utilization of Highway Right-of-Way
- Design Guidelines: Utility Coordination Using Thinking Beyond the Pavement Principles

C) Whenever MDOT SHA's Standard Specifications For Construction And Materials is referred to in this Chapter or this Utility Manual, the latest version of the Supplemental Specifications and Provisions shall be reviewed to ensure the most current specification is used.

6.03 FULLY CONTROLLED ACCESS ROADWAYS

6.03.01 General

A) Fully Controlled Access Roadways are MDOT SHA highways within Fully Controlled Access Right-of-Way and have a functional classification of Freeway. Parkways are generally also a Fully Controlled Access Roadway under Maryland's Annotated Code. See Section 1.09 (B) Fully Controlled Access and Section 1.10 - MDOT SHA FUNCTIONAL CLASSIFICATION OF ROADWAYS (Freeway & Parkway) for additional information.

B) Approval for all utility installations (crossings and telecommunications Resource Sharing) shall be from the appropriate District Engineer or their approved designee via the Complete Authorized Utility Permit unless work is Utility 3rd Party Work incorporated into MDOT SHA's construction project.

6.03.02 Utility Crossings

A) All crossings shall be made as close to a right angle to the centerline of the highway as possible.

1. Any crossings exceeding 20 degrees of the right angle to the centerline of the highway shall require written approval from the MDOT SHA.

B) Utility crossings shall be located for minimum interference with existing, planned, or potential road construction and with regard to other utilities crossing in the same area.

C) Controlled access interchanges shall not be crossed.

1. However, if one of the intersecting roadways is not a Freeway it may be permissible to locate a utility within the "projected" right-of-way of that non-controlled access roadway.

a) Refer to Section 6.04 - PARTIALLY CONTROLLED ACCESS ROADWAYS, Subsection 6.04.02 - Crossings for additional information.

D) Aerial Crossings

1. Aerial utility crossings shall be accommodated at consolidated points along Freeways under MDOT SHA permits.

2. Aerial facilities should not be placed under MDOT SHA structures.

a) Refer to Section 9.03 - AERIAL INSTALLATIONS NEAR STRUCTURES for further guidance.

3. Poles and other above ground appurtenances shall be strictly prohibited within the Fully Controlled Access Rights-of-way.

E) Underground Crossings

1. Underground crossings shall be through sleeves or casings extending from the Right-of-way Line of Through Highway to the Right-of-way Line of Through Highway on the other side.

a) See Section 6.08 - Sleeves and Casings for additional information.

b) Utilities may request to cross Fully Controlled Access Roadways without sleeving their facilities if they propose a crossing which, in the opinion of the MDOT SHA, is as safe and serviceable as a sleeved crossing.

i. Approval for these installations shall be from the appropriate District Engineer or their approved designee via the Utility Permit unless work is Utility 3rd Party Work incorporated into MDOT SHA's construction project.

ii. See Section 6.08.01 - Alternate to Sleeving for additional information.

2. **Crossings shall not be permitted through drainage pipes or culverts**.

3. Bends may be permitted on conduits which will contain electrical or communications cables.

4. Bends in liquid and gas lines may be permitted but shall be avoided to the extent reasonably possible.

5. Vents for sleeves shall be located outside the Right-of-way Line of Through Highway.

6. Underground crossings shall not be placed within 10 feet of MDOT SHA structures unless specifically approved by the appropriate District Engineer or their approved designee **and** OOS.

a) See Section 9.04 - UNDERGROUND INSTALLATIONS NEAR STRUCTURES and Section 9.07 - STRUCTURES REVIEW PROCESS for further guidance.

6.03.03 Longitudinal Utility Installations

A) Longitudinal utility installations shall not be permitted within the Right-of-Way of Through Highway of existing Freeways or within the Right-of-Way of highways that are shown in the Highway Needs Inventory as future Freeways, except for telecommunications as permitted under Resource Sharing.

1. Refer to Section 6.03.01 - RESOURCE SHARING for further guidance.

6.03.04 Highway Conversion to Freeway

A) When a highway is converted to a Freeway as per § 8-619 (c) and § 8-621 of the Annotated Code of Maryland, Transportation Article, all utility poles and longitudinal underground utilities along with all appurtenances shall be relocated outside of the Right-of-way Line of Through Highway.

B) See Section 1.09 (A) Controlled Access and Section 1.10 - MDOT SHA FUNCTIONAL CLASSIFICATION OF ROADWAYS (Freeway and Parkway) for additional information.

C) Where an underground utility crossing already exists when a highway is converted to a Freeway and it can be serviced and operated without access from the roadway, it may remain in place provided the facility meets the following:

1. There is no conflict with any proposed construction.

2. The present depth of cover, without adjustment, will be within MDOT SHA specifications.

3. The existing system is in good condition and can safely withstand the stress of highway construction and maintenance of traffic.

4. No future routine servicing will be required.

5. Any replacement of the facility can and shall be accomplished from outside of the controlled access area.

6.03.05 Use of Medians

A) Access pits may be allowed in the median of a crossing provided that their use is strictly for construction.

1. All safety, construction, backfilling, and restoration of access pits shall be in accordance with CHAPTER 4 – CONSTRUCTION.

B) Any activity in the median shall require special arrangements and shall be approved by the appropriate MDOT SHA District Engineer.

C) Longitudinal median utility installations shall not be permitted except for telecommunications as provided under Section 6.03.07 – Resource Sharing.

6.03.06 Installations That Serve A Transportation Purpose

A) Utility installations that are needed for a transportation purpose, such as for highway lighting or to serve a weigh station, rest or recreational area shall be located and designed in accordance with the requirements of this Utility Manual.

B) Controlled access restrictions do not apply to utility installations and facilities used specifically for a transportation purpose.

6.04 PARTIALLY CONTROLLED ACCESS ROADWAYS

6.04.01 General

A) Partially Controlled Access Roadways are MDOT SHA highways within Partially Controlled Access Right-of-Way and have a functional classification of Expressway. Some Parkways and Major roadways may also be a Partially Controlled Access Roadway. See Section 1.09 (C) Partially Controlled Access and Section 1.10 - MDOT SHA FUNCTIONAL CLASSIFICATION OF ROADWAYS (Parkway, Expressway, & Major) for additional information.

B) For the areas of Controlled Access right-of-way encountered, the Utility shall comply with the requirements of Section 6.03 - FULLY CONTROLLED ACCESS ROADWAYS.

- **a)** However, the Utility may request an exception to the Utility Manual to locate utility facilities within these rights-of-way of Partially Controlled Access Roadways.
- **b)** See Section 2.07 – EXCEPTIONS for further guidance.

C) Approval for all utility installations (crossings and longitudinal) shall be from the appropriate District Engineer or their approved designee via the Complete Authorized Utility Permit unless work is Utility 3rd Party Work incorporated into MDOT SHA's construction project.

6.04.02 Utility Crossings

A) All crossings within **Non-Controlled Access** areas of MDOT SHA right-of-way shall be in accordance with Section 6.05 - Non-Controlled Access Roadways, Subsection 6.05.02 Utility Crossings.

B) All crossings within **Controlled Access** areas of MDOT SHA right-of-way shall be in accordance with Section 6.03 - Fully Controlled Access Roadways, Subsection 6.03.02 Utility Crossings.

C) Controlled access interchanges shall not be crossed.

1. However, if one of the intersecting roadways is not a Freeway it may be permissible to locate a utility within the "projected" right-of-way of that non-controlled access roadway.
   - **a)** Service shall only be permitted from the non-controlled access roadway outside of the ramp connection area.
   - **b)** Manholes and/or poles shall be located outside of the ramp connections.
   - **c)** See Figure 6.03 - Utility along a Non-Controlled Access Roadway Crossing a Controlled Access Interchange.
2. Aerial facilities should not be placed under MDOT SHA structures.
   - **a)** Refer to Section 9.03 - AERIAL INSTALLATIONS NEAR STRUCTURES for further guidance.
3. Underground crossings shall not be placed within 10 feet of MDOT SHA structures unless specifically approved by the appropriate District Engineer or their approved designee **and** OOS.

a) See Section 9.04 - UNDERGROUND INSTALLATIONS NEAR STRUCTURES and Section 9.07 - STRUCTURES REVIEW PROCESS for further guidance.

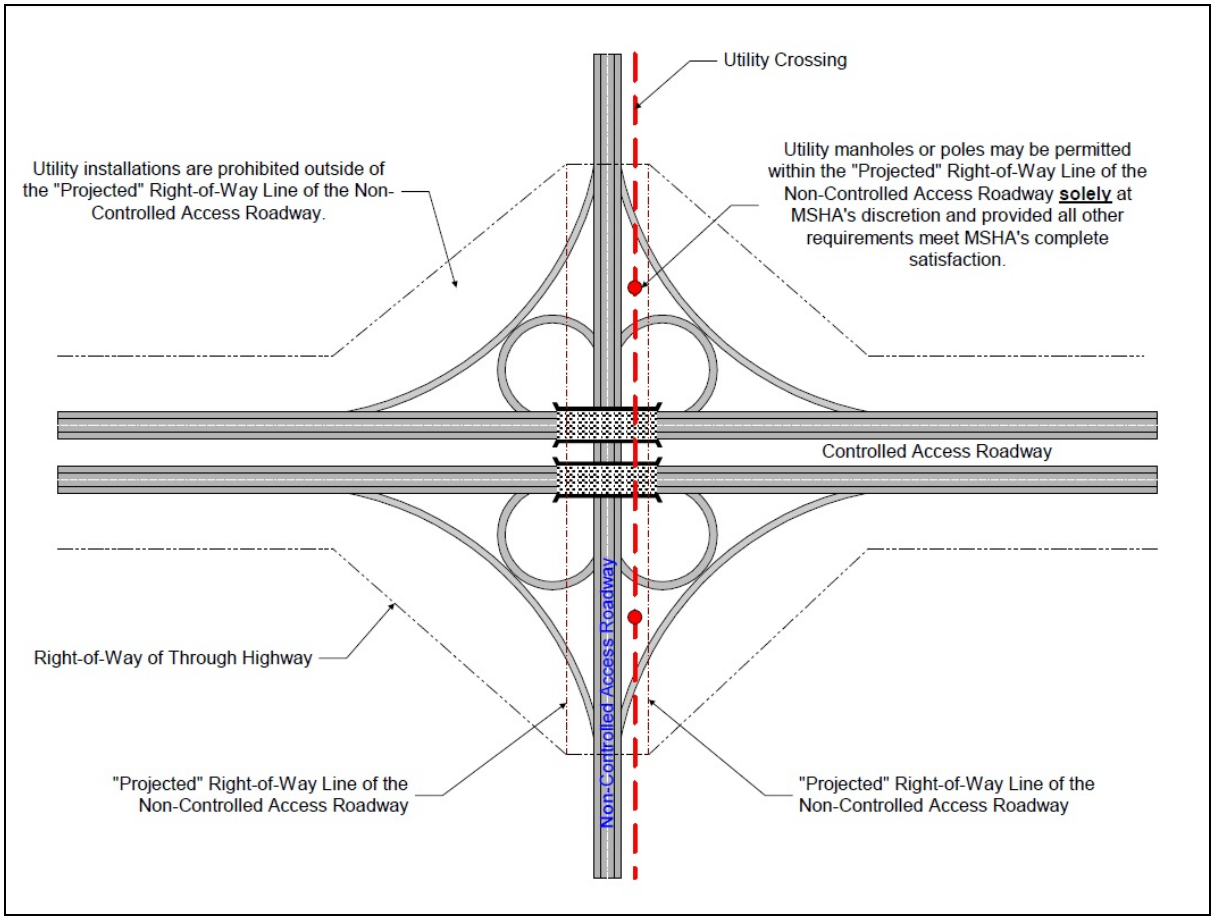


Figure 6.03 - Utility along a Non-Controlled Access Roadway Crossing a Controlled Access Interchange

6.04.03 Longitudinal Utility Installations

1. Longitudinal utility lines within **Non-Controlled Access** areas of MDOT SHA right-of-way shall be in accordance with Section 6.05 - Non-Controlled Access Roadways, Subsection 6.05.03 Longitudinal Utility Installations.

   a) Longitudinal electrical lines, both overhead and underground, shall be limited to 98 kilovolts rms to ground.

2. Longitudinal utility lines shall not be permitted within **Controlled Access** areas of MDOT SHA rights-of-way or within the rights-of-way of highways that are shown in the Highway Needs inventory as future expressways with controlled access.

   a) However, the Utility may request an exception to the Utility Manual to locate utility facilities within these rights-of-way of Partially Controlled Access Roadways.

   b) See Section 2.07 – EXCEPTIONS for further guidance.

6.04.04 Highway Conversion to Expressway

A) When a highway is converted to an Expressway as per § 8-620 of the Annotated Code of Maryland, Transportation Article, the MDOT SHA has the authority to require all utility poles and longitudinal underground utilities along with all appurtenances to be relocated outside of the Right-of-way Line of Through Highway.

B) See Section 1.09 (A) Controlled Access and Section 1.10 - MDOT SHA FUNCTIONAL CLASSIFICATION OF ROADWAYS (Parkway, Expressway, & Major) for additional information.

C) Where an underground utility crossing already exists when a highway is converted to a Expressway and it can be serviced and operated without access from the roadway, it may, at MDOT SHA's sole discretion, remain in place provided the facility meets the following:

1. There is no conflict with any proposed construction.

2. The present depth of cover, without adjustment, will be within MDOT SHA and industry specifications.

3. The existing system is in good condition and can safely withstand the stress of highway construction and maintenance of traffic.

4. No future routine servicing will be required.

5. Any replacement of the facility can and shall be accomplished from outside of the controlled access area.

6.04.05 Use of Medians

A) Each proposed Utility use of the median within **Non-Controlled Access** areas of MDOT SHA right-of-way of Partially Controlled Access Roadways will be considered on its individual merits by the appropriate District Engineer or their approved designee.

1. Where it is feasible and reasonable to locate utility lines elsewhere, the Utility use of medians will not be permitted.

B) Use of medians within **Controlled Access** areas of MDOT SHA right-of-way shall be in accordance with Section 6.03 - Fully Controlled Access Roadways, Subsection 6.03.05 Use of Medians.

6.04.06 Installations That Serve A Transportation Purpose

A) Utility installations that are needed for a transportation purpose, such as for highway lighting or to serve an MDOT SHA facility, rest or recreational area shall be located and designed in accordance with the requirements of this Utility Manual.

B) Controlled access restrictions do not apply to utility installations and facilities used specifically for a transportation purpose.

6.05 NON-CONTROLLED ACCESS ROADWAYS

6.05.01 General

A) Non-Controlled Access Roadways are MDOT SHA highways within MDOT SHA Right-of-Way but do not have any right-of-way access controls. Non-Controlled Access Roadways have a functional classification of Collector and Local. Major roadways are generally Non-Controlled Access Roadways. See Section 1.09 (D) Non-Controlled Access and Section 1.10 - MDOT SHA FUNCTIONAL CLASSIFICATION OF ROADWAYS (Major, Collector, & Local) for additional information.

B) In the event Controlled Access right-of-way is encountered (such as at a Controlled Access interchange or along a Major Roadway), the Utility shall comply with the requirements of Section 6.04 - PARTIALLY CONTROLLED ACCESS ROADWAYS.

1. The Utility may request an exception to the Utility Manual to locate utility facilities within these Controlled Access rights-of-way.

2. See Section 2.07 – EXCEPTIONS for further guidance.

C) Approval for all utility installations (crossings and longitudinal) shall be from the appropriate District Engineer or their approved designee via the Complete Authorized Utility Permit unless work is Utility 3rd Party Work incorporated into MDOT SHA's construction project.

6.05.02 Utility Crossings

A) All crossings shall be made as close to a right angle to the centerline of the highway as possible.

1. Approval for all crossings exceeding 20 degrees of the right angle to the centerline of the highway shall be from the appropriate District Engineer or their approved designee via the Complete Authorized Utility Permit unless work is Utility 3rd Party Work incorporated into MDOT SHA's construction project.

B) Utility crossings shall be located for minimum interference with existing, planned, or potential road construction and with regard to other utilities crossing in the same area.

C) All utility poles and above ground or surface appurtenances shall be located in compliance with Section 2.06 - ADA REQUIREMENTS.

D) Aerial Crossings

1. Aerial utility crossings should be consolidated at points along MDOT SHA highways.

a) Aerial utility crossings shall be consolidated or joint-use with other aerial utility facilities in compliance with Section 6.13 - CONSOLIDATION AND JOINT USE.

b) Poles shall be located one foot inside the right-of-way line where possible.

2. Aerial facilities should not be placed under MDOT SHA structures.

a) Refer to Section 9.03 - AERIAL INSTALLATIONS NEAR STRUCTURES for further guidance.

E) Underground Crossings

1. At the sole discretion of the appropriate District Engineer or their approved designee, the MDOT SHA may require the Utility to install underground crossings through sleeves or casings.

a) Sleeves or casings need only extend from the ditch centerline to the ditch centerline on the other side.

b) See Section 6.08 - SLEEVES and CASINGS for additional information.

c) Utilities may request to cross Non-Controlled Access Roadways without sleeving their facilities if they propose a crossing which, in the opinion of the MDOT SHA, is as safe and serviceable as a sleeved crossing.

d) See Section 6.08.01 – Alternate to Sleeving for additional information.

2. Crossings shall not be permitted through drainage pipes or culverts.
3. Bends will be permitted on conduits which will contain electrical or communications cables.
4. Bends in liquid and gas lines should be avoided where possible.
5. Vents for sleeves shall be located beyond the ditch line.
6. Underground crossings shall not be placed within 10 feet of SHA structures unless specifically approved by the appropriate District Engineer or their approved designee and OOS.
   a) See Section 9.04 - UNDERGROUND INSTALLATIONS NEAR STRUCTURES and Section 9.07 - STRUCTURES REVIEW PROCESS for further guidance.

6.05.03 Longitudinal Utility Installations

A) Longitudinal utility installations shall be located for minimum interference with existing, planned, or potential road construction and with regard to other utilities crossing in the same area.

B) The alignment selection of longitudinal utility installations shall be made with cognizance of existing and future longitudinal locations by other utilities parallel to the one being located.

C) Longitudinal electrical lines, both overhead and underground, shall be limited to 98 kilovolts rms to ground.

D) **Aerial Longitudinal Installations**

1. Longitudinal aerial lines shall be located close to the right-of-way line, one foot inside, if possible.
2. Aerial facilities should not be placed under MDOT SHA structures.
   a) Refer to Section 9.03 - AERIAL INSTALLATIONS NEAR STRUCTURES for further guidance.

E) **Underground Longitudinal Installations**

1. The underground utilities shall be installed outside of the shoulders, preferably between the ditch centerline and a line 3 feet inside the right-of-way line to allow a safe location strip for overhead facilities.
2. Underground longitudinal utility installations shall not be placed within 10 feet of MDOT SHA structures unless specifically approved by the appropriate District Engineer or their approved designee and OOS.
   a) See Section 9.04 - UNDERGROUND INSTALLATIONS NEAR STRUCTURES and Section 9.07 - STRUCTURES REVIEW PROCESS for further guidance.

6.06 URBAN AREAS

In urban areas where adequate right-of-way does not exist outside the traveled roadway or sidewalk, the appropriate District Engineer or their approved designee may relax the restrictions of this Section to accommodate utilities if it is determined that the levels of service and safety intended for this section of highway are not unreasonably compromised.

6.07 SURFACE MARKERS & UNDERGROUND MARKERS/LOCATION DEVICES

A) Utilities are typically located in the field by various means because maps and other records often lack the pinpoint precision needed to ensure proper clearance for construction and maintenance activities.

B) The various types of markers and locating devices used within MDOT SHA rights-of-way are as follows:

Marker Posts: The primary function of above ground markers is to identify location and alert those who might be working in the area. In accordance with PHMSA, underground pipelines should be marked with permanent pipeline markers in a "line-of sight" fashion to indicate presence and location. These markers shall note size of pipe, transmittant, owner's name, emergency telephone numbers, and any other information required by industry standards.

Soil Markers: This type of surface marker can be used where posts won't work. They eliminate home owner's complaints of marker posts on their property. These markers can be walked on, mowed over, and driven on and used to quickly locate buried drops, stub ends, valves, handholes, manholes, and test stations. These markers shall note size of pipe, transmittant, owner's name, emergency telephone numbers, and any other information required by industry standards.

Marking Tape: Marking Tape has been traditionally used to prevent damage to underground utility lines during excavation. Marking tape shall be buried, no more that 12 inches, directly above electrical lines, gas pipes, communication cables, and other utility installations. Detectable Underground Warning Tape has an aluminum backing which can be used for locating underground utility installations.

Tracer Wire: Tracer wire is buried with electrical lines, gas pipes, communication cables, and other utility installations and is used to conductively locate buried utility lines. Tracer wire is generally used in conjuction with other marking methods.

RFID (Radio Frequecy IDentification) Markers: RFID markers are a recent technology to electronically identify underground facilities. The RFID Markers are buried, no more than 12 inches, directly over underground facilities at key locations. A locator transmits an RF signal to the buried marker. The marker returns the signal to the locator, indicating the marker's position.

C) Surface markers shall be located at or outside the highway right-of-way line except for facilities crossing non-controlled access highways (1) in cities, business, or residential districts or (2) where the placement of markers is not practical and would not serve the purpose for which markers are intended.

1. Refer to Figure 6.07 – Utility Markers/Location Devices for typical placement information.

D) A combination of surface markers and/or underground markers; and locating devices; shall be used when installing underground facilities within MDOT SHA rights-of-way.

1. The MDOT SHA, at its sole discretion, may require all, or any combination of, surface markers and/or underground markers; and locating devices; to be used when installing underground facilities within MDOT SHA rights-of-way.

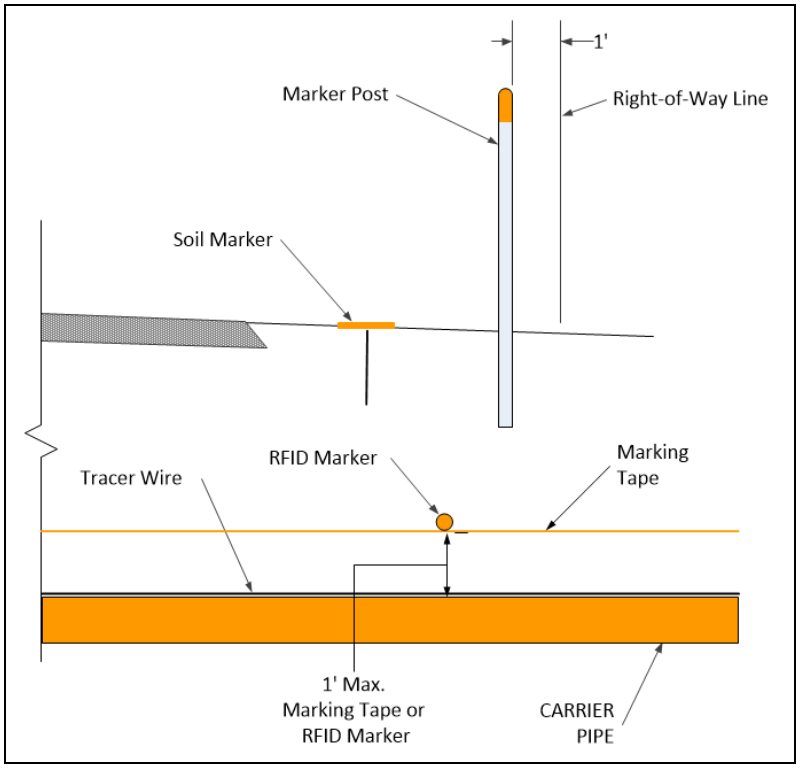


Figure 6.07 – Utility Markers/Location Devices

6.07.01 Utility Pole Delineation

A) Utility pole delineation is generally used when other strategies are not feasible. In this strategy, the pole is delineated or lighted to make the pole more visible. For example, Pennsylvania DOT has started introducing reflective taping on utility poles to improve the driver's ability to see these poles at night. While this strategy does not reduce the severity of the crash, it may help drivers see the object and take the necessary evasive actions. This line of reasoning assumes that the errant vehicles are under some level of control or can be brought under control after the driver is alerted to the presence of the pole. However, if the vehicle is out of control, then the fact that the pole is delineated or more visible does not reduce the probability of the crash.

B) A major problem with this strategy is that its low cost may make it appear attractive, but it may not provide any real improvement in safety. Application of this strategy should be limited to poles where other strategies cannot be applied. AASHTO's Policy on Geometric Design of Highways and Streets places the order of preference for treating objects in the clear zone as follows:

1. Redesign the facility to reduce ROR (Run Off Road) crash potential (new or redesigned roads).
2. Remove the object; relocate the object.
3. Redesign the object to lessen the impact; shield the object.
4. Delineate the object.

C) Utility pole delineation is discussed as a strategy to improve utility pole safety in FHWA's Roadside Tree and Utility Pole Management.

6.08 SLEEVES AND CASINGS

A) Since a pipeline carrying a volatile fluid or gas under pressure; or a non-volatile fluid, such as sewer or water line under pressure can cause damage or injury if there is a rupture, it poses a certain element of risk when under a highway. In either case, when such a carrier is placed in a casing pipe of leak proof construction, leakage can be discharged safely, and the casing becomes a "second line of defense" against damage to MDOT SHA's highways or structures.

B) Utilities may be allowed to cross State and Federal highways without sleeving their facilities if they propose a crossing which, if in the sole opinion of the MDOT SHA, is as safe and serviceable as a sleeved crossing, otherwise the Utility shall be required to comply with this Section 6.08 – SLEEVES AND CASINGS.

1. Refer to Section 6.08.01 - Alternate to Sleeving for additional guidance.

C) Pressurized utilities shall be sleeved or encased to minimize undermining roadways or structures in the event of damage or rupture to the carrier pipe. Casing pipes are to be designed to accommodate all externally applied loads.

1. Sleeves or casing pipe shall be used within the entire Roadbed Area of Influence for roadways.

a) Refer to Section 4.07.02 - Roadbed Area of Influence for additional guidance.

2. Sleeves or casing pipe shall be used within the entire Zone of Influence for bridge structures.

a) Refer to Section 9.04 - UNDERGROUND INSTALLATIONS NEAR STRUCTURES for additional guidance.

3. Underground pressurized volatile fluid lines.

a) The casing pipe is to be sealed to the carrier pipe at each end.

b) Casing pipes are to extend for the full width of the right-of-way and/or sufficiently beyond the roadway or structure foundation/footings, so that the transmittants from a broken carrier pipe will be safely discharged.

c) See Figure 6.08 - Pressurized Volatile Fluid Line Crossing With Casing for additional information.

4. Underground pressurized liquid (water, sewer force mains, etc.) near Structures.

a) Casing pipes are to extend for the full width of the right-of-way and/or sufficiently beyond the roadway or structure foundation/footings, so that the transmittants from a broken carrier pipe will be safely discharged.

b) The casing pipe shall be sealed to the carrier pipe at the high end and open into a manhole at the low end. The casing may be either steel or reinforced concrete, and shall be designed for all externally applied loads and for the internal pressure from a ruptured carrier pipe. A valve is to be installed on the pressure side of the right-of-way.

c) See Figure 6.08.01 - Pressurized Liquid Line Crossing With Casing for additional information.

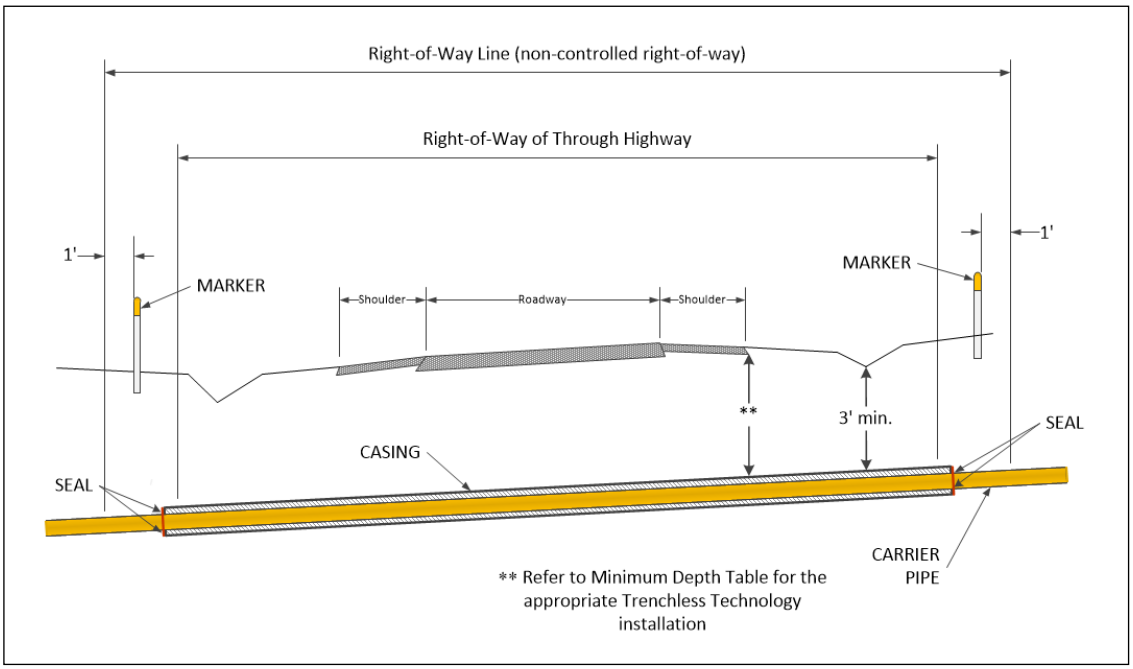


Figure 6.08 - Pressurized Volatile Fluid Line Crossing With Casing

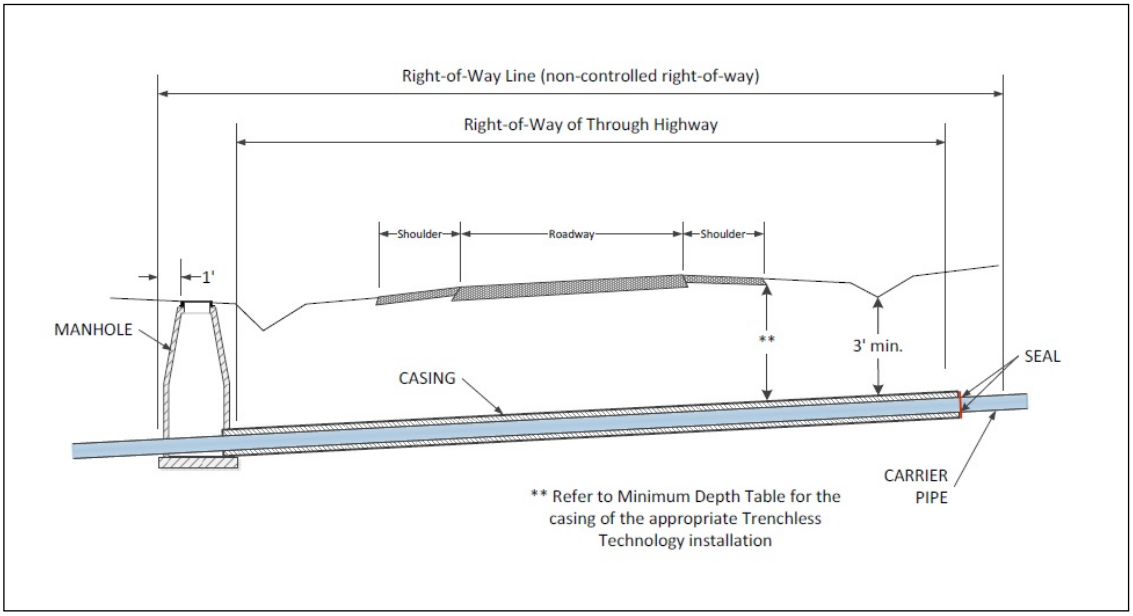


Figure 6.08.01 - Pressurized Liquid Line Crossing With Casing

6.08.01 Alternate to Sleeving

A) Liquid and Gas Utilities wanting to cross State and Federal highways without sleeving their facilities may be allowed to do so if they propose a crossing which, if in the opinion of the MDOT SHA, is as safe and serviceable as a sleeved crossing.

B) When the Utility is proposing to cross State and Federal highways without sleeving, the following specific information about the proposed piping system shall be submitted to the appropriate District Engineer or their approved designee for an engineering evaluation and approval:

1. Documentation that the proposed piping system complies with the design requirements of Section 2.01- DESIGN.

2. The section carrier pipe used for the crossing shall be structurally stronger compared to the carrier pipe installed for the rest of the project.

a) Higher yield strength may be accomplished by using the next increment heavier wall thickness of pipe; using pipe with greater tensile strength; or other method approved by the MDOT SHA.

i. The Utility shall provide calculations' documenting the carrier pipe **for the project** meets any appropriate AWWA, ANSI, or PHMSA requirements as per Section 2.01.02 - General Design Requirements, Subsection D).

ii. The Utility shall provide calculations' documenting the carrier pipe **for the crossing** is structurally stronger compared to the carrier pipe installed for the rest of the project.

b) Crossings within areas of Controlled Access right-of-way, the structurally stronger carrier pipe shall extend from Right-of-Way Line of Through Highway to Right-of-Way Line of Through Highway.

3. Crossings, depending on the controlled access, shall be in accordance with:

a) 6.03 - FULLY CONTROLLED ACCESS ROADWAYS, Subsection 6.03.02 Utility Crossings; or

b) 6.04 - PARTIALLY CONTROLLED ACCESS ROADWAYS, Subsection 6.04.02 Utility Crossings; or

c) 6.05 - NON-CONTROLLED ACCESS ROADWAYS, Subsection 6.05.02 Utility Crossings

4. Depth of cover shall be in accordance with Section 6.10 – DEPTH OF COVER.

5. The pipe within the MDOT SHA right-of-way shall have as few joints and changes in direction as reasonably possible.

6. Installations of underground utility facilities within ten (10) feet of any structure shall require the review and approval of both the OOS and the appropriate District Engineer or their approved designee.

a) See Section 9.04 - UNDERGROUND INSTALLATIONS NEAR STRUCTURES and Section 9.07 - STRUCTURES REVIEW PROCESS for further guidance.

7. Markers and location devices shall be placed and/or installed in accordance with Section 6.07 - SURFACE MARKERS & UNDERGROUND MARKERS/LOCATION DEVICES.

6.09 CONCRETE ENCASEMENT AND CAPPING

Encasement and capping of utilities is permitted where conditions warrant. Encasement, in this manual, is defined as the surrounding of a carrier pipe with concrete to protect the carrier from the load imposed by the highway and its traffic. Capping is defined as the placing of a concrete slab over a facility. These techniques are useful when the carrier pipe must be used with minimal cover or when unusually heavy loading is expected as in an area where large earth moving equipment will be operating. Encasement is not to be substituted for sleeving.

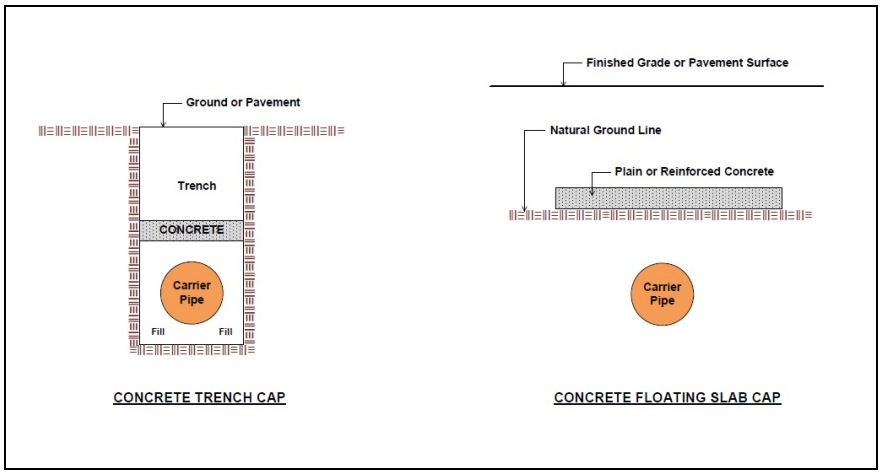


Figure 6.07-1 Concrete Caps

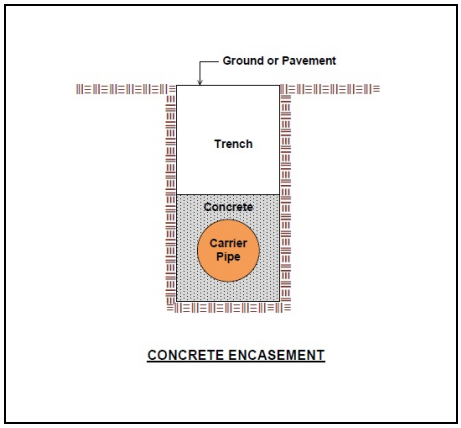


Figure 6.07-2 Concrete Encasement

6.10 DEPTH OF COVER

A) Fully Controlled Access Roadways & Controlled Access areas of Partially Controlled Access Roadways

1. The minimum depth of cover for any utility shall be five (5) feet from finished grade to the top of the utility unless a greater burial depth is required by:

a) Federal, State, or local regulations; or

b) Industry codes; or

c) The method of Trenchless Installation; or

i. Refer to Jack and Bore Minimum Depth Table, HDD Minimum Depth Table, Tunnel Minimum Depth Table, & Impact Moling/Missiling Minimum Depth Table for additional information.

d) A determination from the appropriate District Engineer or their approved designee that additional depth is necessary.

2. The minimum depth of cover for any utility shall be three (3) feet from the bottom of any ditch to the top of the utility unless a greater burial depth is required by the MDOT SHA.

B) Non-Controlled Access Roadways & Non-Controlled Access areas of Partially Controlled Access Roadways

1. The minimum depth of cover for any utility shall be three (3) feet from finished grade and/or the bottom of any ditch to the top of the utility unless a greater burial depth is required by;

a) Federal, State, or local regulations; or

b) MDOT SHA; or

c) Industry codes; or

d) A determination from the appropriate District Engineer or their approved designee that additional depth is necessary; or

e) The method of Trenchless Installation.

i. Refer to Jack and Bore Minimum Depth Table, HDD Minimum Depth Table, Tunnel Minimum Depth Table, & Impact Moling/Missiling Minimum Depth Table for additional information.

2. Minimum depths of less than three feet to the top of communication or electric vaults may be approved by the MDOT SHA where the greater depth of cover would unreasonably restrict utility operations.

6.11 VERTICAL CLEARANCES

A. For all aerial facilities either longitudinal to any roadway or crossing of any roadway, the following minimum vertical clearances shall be required:

1. 18 feet - for communication cables, guy wires and electric wires, cables, conductors, and any other live parts below 750 volts

2. 20 feet - for electric wires, cables, conductors, and any other live parts with voltages between 750 volts and 22KV.

3. 20 feet plus .4 inch/KV in excess of 22KV - for electric wires, cables, conductors, and any other live parts with voltages between 22 KV and 470 KV.

B. All clearances are absolute minimums based on worst case considerations of electrical conductor loading, physical conductor loading, and ambient conditions. The minimum vertical

clearance is herein defined as the shortest vertical distance of the line over any location on the MDOT SHA right-of-way.

C. Refer to the National Electric Safety Code ANSI-C2 for additional clearance information.

D. The top of signal heads at signalized intersections are usually between 22 feet and 23 feet. Therefore, the minimum vertical clearance for any line shall be 23 feet.

1. If the line is within the Clearance Zone of the National Electric Safety Code (NESC), the minimum vertical clearance shall be 23 feet **plus** the required clearance of the NESC.

2. Refer to Figure 6.11 Signalized Intersection Vertical Clearances for additional information.

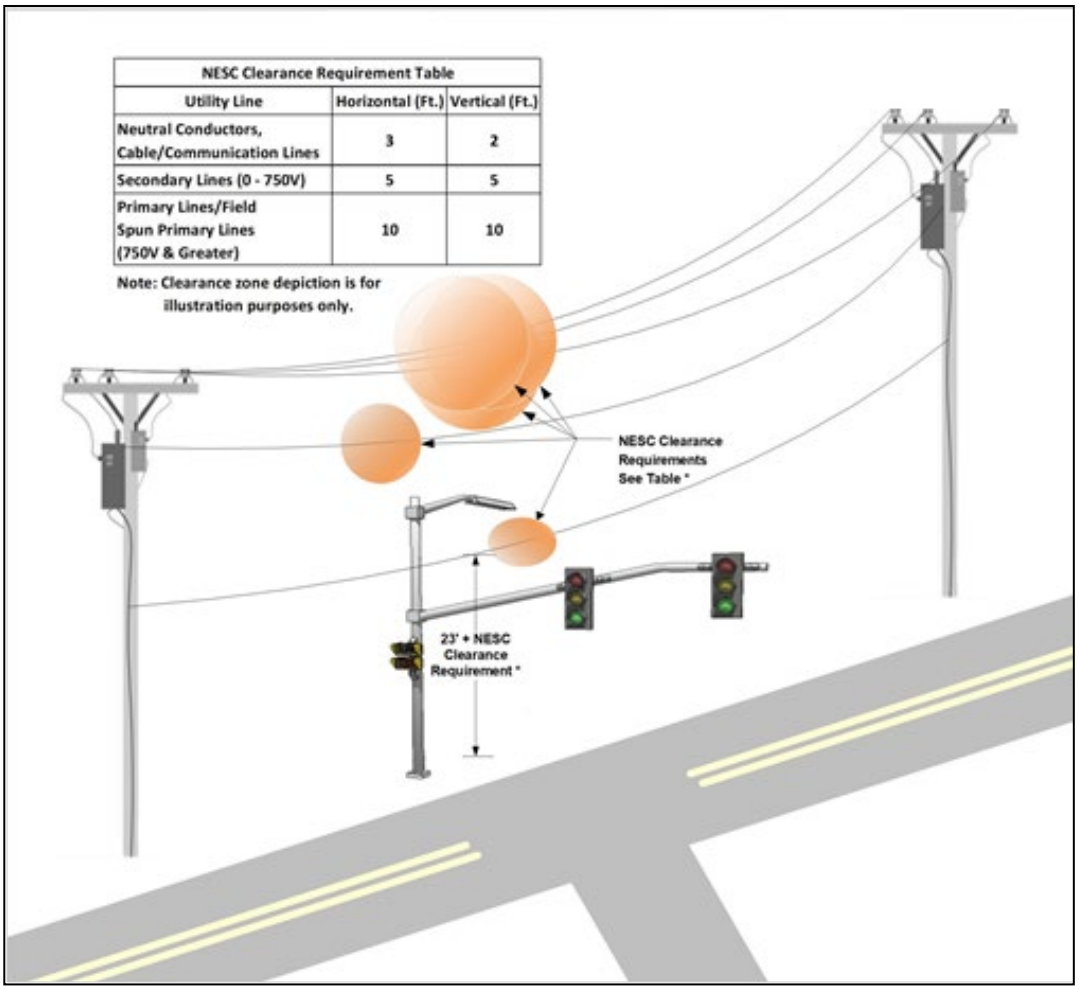


Figure 6.11 Signalized Intersection Vertical Clearances

6.12 HIGH VOLTAGE LINE ACT

A) The High Voltage Line Act is applicable to conductors or poles carrying conductors which must be temporarily relocated, de-energized, or shielded only because of construction equipment or personnel which may come within the dangerous proximity of conductors.

1. See Section 4.03 – SAFETY, Subsection D on the High Voltage Line Act for more information.

B) Utilities shall design and install pole line systems which are in the vicinity of: programmed future structures; or traffic control systems; or areas where crane activity is expected, in a location to avoid later adjustments under the High Voltage Line Act.

6.13 CONSOLIDATION AND JOINT USE

A) A Utility is expected to consolidate its facilities when performing relocation work or installing new utilities in order to preserve as much of the corridor as possible for the transportation function and for the accommodation of other utilities. Similarly, Utilities have a strong obligation to enter into joint use agreements with other utilities wherever possible as such practices are more economical or otherwise more desirable than installing multiple redundant facilities.

B) Additional poles to accommodate aerial facilities frequently results in more fixed objects and/or congestion in sidewalks and other pedestrian travel ways. This often results in difficulties in compliance with ADA requirements. The MDOT SHA therefore requires utilities to consolidate aerial facilities, where possible, thereby reducing or eliminating the necessity for installation of additional poles.

C) On MDOT SHA projects or other situations where multiple utilities are required to relocate facilities, the MDOT SHA will require the various utilities to utilize joint trenches, where possible, in order to preserve as much of the corridor as possible for the transportation function.

D) The MDOT SHA may require proof that crosstalk or technical problems will not allow consolidation or joint use techniques to be employed.

6.14 OUT-OF-SERVICE & DEACTIVATED UTILITIES

A) General

1. In the past, the term "abandonment" was used to denote utility facilities that were deactivated or taken out-of-service. As the connotation of this term implied that there was no further responsibility for the facility, this term is no longer used.

a) The Utility shall be responsible for any utility facility that is deactivated or taken out-of-service unless otherwise agreed to, in writing, by the MDOT SHA and the Utility.

2. There are various situations where a Utility may request a facility to be deactivated or taken out-of-service. These include:

a) Construction or Maintenance activities (MDOT SHA or the Utility)

b) Emergencies

c) Utility facilities may wear out, exceed their design life or become obsolete.

3. Utility facilities that are deactivated or taken out of service for construction or maintenance activities; or for emergencies are generally temporary and of a short duration.

a) This Section 6.14 – Out-of-Service and Deactivated Utilities is not intended to address utility facilities that are deactivated or taken out of service for construction or maintenance activities; or for emergencies.

b) Refer to CHAPTER 4: UTILITY CONSTRUCTION and Section 3.06 - EMERGENCY UTILITY REPAIRS for additional information for these situations.

4. The Utility shall submit, in writing, to the MDOT SHA a request to leave in place within MDOT SHA's right-of-way utility facilities deactivated or taken out-of-service due to wearing out, exceeding their design life, or becoming obsolete.
   - **a)** The MDOT SHA may approve the Utility's request provided the out-of-service or deactivated underground facility left in place does not:
     - **i.** Compromise the safety of any transportation facility user during construction or maintenance operations.
     - **ii.** Prevent other utilities from being placed in the area when alternatives are unavailable.
     - **iii.** Create a maintenance condition that would be disruptive to the transportation facility.
   - **b)** Refer to Section 6.14 - OUT-OF-SERVICE & DEACTIVATED UTILITIES, Subsection C) Placing Facilities Out-of-Service for further guidance.
5. The MDOT SHA expects all out-of-service or deactivated utilities shall remain out-of-service.
6. The MDOT SHA may require the Utility to remove the out-of-service or deactivated utility facility, in its entirety or any portion or segment thereof, at any time in the future at the Utility's sole expense.
7. Out-of-service or deactivated utility facilities are the **responsibility and property of the Utility.**
   - a) Deactivating or placing utility facilities out-of-service shall **not** relieve the Utility of financial responsibility.
   - b) Unless the MDOT SHA has, in writing, informed the Utility that the MDOT SHA will assume ownership of the out-of-service or deactivated utility facility, in its entirety or any portion or segment thereof.

B) Out-of-Service and Deactivated Facilities Requiring Removal

1. Any out-of-service or deactivated utility facility that contains a hazardous material(s) shall not be permitted to remain within MDOT SHA right-of-way.
   - **a)** The removal and restoration shall be accomplished within six (6) months unless the Utility and the MDOT SHA agree on a different mutually agreeable timeframe.
   - **b)** The Utility shall restore MDOT SHA's right-of-way in accordance with Section 4.08 - RESTORATION.
   - **c)** Facilities no longer required shall be completely removed at the Utility's expense.
2. Any out-of-service or deactivated aerial utility facility shall not be permitted to remain within MDOT SHA right-of-way.
   - **a)** The removal and restoration shall be accomplished within six (6) months unless the Utility and the MDOT SHA agree on a different mutually agreeable timeframe.
   - **b)** The Utility shall restore MDOT SHA's right-of-way in accordance with Section 4.08 - RESTORATION.
   - **c)** Facilities no longer required shall be completely removed at the Utility's expense.

C) Deactivating or Placing Facilities Out-of-Service

1. All requests shall be submitted, in writing, to the appropriate District Engineer or their approved designee.

a) All requests to deactivate or place utility facilities out of service and to leave them in place within MDOT SHA's right-of-way shall require a valid justification from the Utility for review and approval.

b) Without valid justification, all out of service or deactivated facilities shall be removed.

2. At the discretion of the appropriate District Engineer or their approved designee, the MDOT SHA may:

a) Approve the request to allow the utility facility out-of-service or deactivated left in place;

i. The Utility shall comply with Section 6.14 - OUT-OF-SERVICE & DEACTIVATED UTILITIES, Subsection D) Out-of-Service and Deactivated Facilities Left In Place.

b) Require the removal of out-of-service or deactivated utility facilities and restoration of the right-of-way.

i. The removal and restoration shall be accomplished within six (6) months unless the Utility and the MDOT SHA agree on a different mutually agreeable timeframe.

ii. The Utility shall restore MDOT SHA's right-of-way in accordance with Section 4.08 - RESTORATION.

iii. The cost shall be the responsibility of the Utility Company.

c) Assume ownership of the out-of-service or deactivated utility facility, in its entirety or any portion or segment thereof.

i. If in the opinion of the appropriate District Engineer or their approved designee, the out-of-service or deactivated utility facility, in its entirety or any portion or segment thereof, may be used by the MDOT SHA for a transportation purpose or need or future transportation purpose or need.

ii. The MDOT SHA may require the Utility to remove the cable, wire, carrier pipe, or transmittant.

iii. The Utility shall not be compensated by the MDOT SHA for assuming ownership of any out-of-service or deactivated utility facility, in its entirety or for any portion or segment thereof.

D) Out-of-Service and Deactivated Facilities Left In Place

1. In the event that the MDOT SHA approves leaving an out-of-service or deactivated utility in place, the MDOT SHA shall require the Utility to protect and partially restore MDOT SHA right-of-way by:

a) Removing to a practical degree any surface structures such as manholes, valve boxes, splice boxes, and meter boxes.

b) The remains shall be backfilled and restored in accordance with Section 4.08 - RESTORATION.

c) Any out-of-service or deactivated cast iron or concrete piping shall be bulkheaded and/or otherwise sealed at both ends.

d) Out-of-service or deactivated piping 8" in diameter or greater made of other material shall be completely filled with grout.

e) Performing any other removal, action, or restoration as determined necessary by the appropriate District Engineer or their approved designee.

2. For all utility facilities approved by MDOT SHA to be left out-of-service or deactivated in place, the utility shall:

a) Maintain records of the utility's location, size, and type of material.

b) Furnish such records to the MDOT SHA upon request.

c) Show such utilities on all utility work / relocation plans when required by the MDOT SHA.

E) Returning an Out-of-Service or Deactivated Facility to Service

1. The utility shall obtain a new Utility Permit to return an out-of-service utility to active service in accordance with Chapter 3 - PERMITS.

2. This requirement does not apply if the service is restored for a temporarily deactivated facility as a result of an emergency or for an MDOT SHA construction project.

3. The MDOT SHA does not accept financial responsibility to adjust or relocate an out-of-service or deactivated utility facilities.

6.15 RESOURCE SHARING

6.15.01 Introduction

A) General Information

1. The MDOT SHA employs two overall strategies in achieving MDOT SHA's communication objectives. These are Inter-Governmental Partnering and Resource Sharing. The benefits realized by these strategies are significant cost savings and improved operational efficiencies.

2. MDOT SHA's communication objectives support multiple statewide applications including, but not limited to, MDOT SHA's Intelligent Transportation System (ITS); Coordinated Highways Action Response Team (CHART); networkMaryland™; Maryland FiRST Radio System; data and voice communications; video teleconferencing; and other governmental broadband services.

3. While Inter-Governmental Partnering is briefly mentioned in this section, this Utility Manual more fully addresses the requirements for accommodating telecommunication facilities under Resource Sharing.

B) Inter-Governmental Partnering

1. With Inter-Governmental Partnering, the MDOT SHA partners with State and County agencies in sharing communications infrastructure such as Public Safety Towers, Microwave, and Equipment Shelters. By sharing with governmental entities, both the governmental entity and MDOT SHA are able to achieve interoperability and reduce capital costs for communications infrastructure. Inter-Governmental Partnering allows the MDOT

SHA to share communications infrastructure with many counties and state agencies by providing MDOT SHA access to place antennas and radio system equipment on county owned towers or other state agency towers rather than constructing new MDOT SHA owned towers. The MDOT SHA also allows sharing of its communication infrastructure with other State agencies, counties, and local government which promotes lowered costs, due to fewer towers being needed, more manageable maintenance costs and a more robust infrastructure network.

2. MDOT SHA's Office of CHART & ITS Development - ITS Division is the lead in facilitating Inter-Governmental Partnering.

C) Resource Sharing

1. Resource Sharing (RS) involves a request by a Private Sector entity to the MDOT SHA to allow non-exclusive use of the MDOT SHA's rights-of-way, other MDOT SHA real estate; and/or the MDOT SHA's existing communications infrastructure by the Private Sector entity for the installation, operation, and maintenance of communications systems for itself in exchange for providing communications equipment, services, and/or revenue to the State.

a) Any proposal to install a telecommunication facility within MDOT SHA's rights-of-way (fully controlled access, partially controlled access, and/or non-controlled access) and other MDOT SHA real estate may be considered as RS as determined by the MDOT.

i. Refer to Section 1.09 CONTROLLED ACCESS HIGHWAYS for more information on MDOT SHA's rights-of-way.

b) Monetary compensation received by the MDOT SHA from Resource Sharing is placed into the Major Information Technology Development Project Fund to support major information technology development projects.

2. The types of RS projects undertaken by the MDOT SHA and a Private Sector entity may include, but not limited to, the installation of conduit and/or fiber optic cabling facilities; construction of new wireless communication facilities; collocation of wireless communication facilities on existing towers or allocation of fiber strands acquired from previous RS projects; or other transportation technologies such as data sharing.

3. Non-MDOT SHA owned communication/IT facilities may be allowed to install facilities longitudinally within the access control limits of fully controlled access highways ONLY under RS in accordance with this section.

a) All non-MDOT SHA communication/IT facilities allowed longitudinally within the access control limits of fully controlled access highways shall be subject to RS regardless if the Appurtenance, Facility, or Utility System is a Utility or a Private Line.

4. MDOT SHA's Office of Construction - Utilities Division is generally the lead in facilitating Private Sector Resource Sharing.

a) MDOT SHA's Office of CHART & ITS Development - ITS Division may be the lead in facilitating Inter-Governmental Partnering and Private Sector Resource Sharing if the RS Project involves state owned communications infrastructure such as the Public Safety Towers.

D) Resource Sharing Laws, Regulations, and Policies

1. Federal

a) The Telecommunications Act of 1996 (Public Law 104-104) and guidance under "Freeway Accommodation Policies" indicate States may, at their discretion, charge fees for longitudinal utility use of highway right-of-way.

b) States may charge fees at their discretion for longitudinal utility use of highway right-of-way... The FHWA encourages States to use generated revenues for transportation purposes.

c) Private line longitudinal use of highway right-of-way is covered by 23 U.S.C. 156. States are required to charge fees for such use based on fair market value and to use such fees for Title 23 purposes.

d) Refer to the FHWA Program Guide (FAPG): Utility Relocation and Accommodation On Federal-Aid Projects for additional information.

2. State

a) The MDOT SHA enters into Resource Sharing Agreements (RSA) for telecommunication purposes as per §3A-307 of Division 1 of the State Finance and Procurement Article of the Annotated Code of Maryland.

i. Refer to §3A-307 of Division 1 of the State Finance and Procurement Article of the Annotated Code of Maryland for general information on Maryland's RS Process.

ii. Refer to Subsection 6.15.05 - Resource Sharing Process for additional guidance.

b) MDOT SHA RS Projects are facilitated through the Maryland Department of Transportation – Office of Transportation Technology Services; reviewed by the Department of Information Technology; and approved by MDOT SHA's Deputy Administrator - Chief Engineer for Operations - Operations.

c) The Maryland Department of Information Technology (DoIT) establishes the overall general policy, and the various rates, used for information technology RS for the State of Maryland.

i. Refer to DoIT's Resource Sharing Agreements Program Policy on DoIT's website at https://doit.maryland.gov/policies/Documents/policyplanning/DoIT-RSA-Policy.pdf

E) Definitions

For purposes of this Section 6.15 – RESOURCE SHARING, the following abbreviations and term have the meanings indicated below:

ASTM - American Society for Testing and Materials

BPW – Maryland Board of Public Works

CHART - Coordinated Highways Action Response Team

Company – Private Sector Entity that submits a proposal to the state for Resource Sharing

EIA/TIA - Electronic Industries Association / Telecommunications Industry Association

FAA - Federal Aviation Administration

FCC - Federal Communications Commission

IT – Information Technology

ITS - Intelligent Transportation System

ITU - International Telecommunication Union

LPC - Legislature Policy Committee

RS – Resource Sharing

RSA – Resource Sharing Agreement

F) Qualifications For Participating In Resource Sharing

1. The Company shall provide documentation demonstrating prior experience in the installation and maintenance of communication facilities. The documentation shall include the following information:
   - **a)** Past experience with similar projects of comparable size and complexity.
   - **b)** Its experience rendering services similar to its proposal to the MDOT SHA; the number of years the Company has provided these services; the number of clients and geographic locations the Company currently serves, etc.
   - **c)** The corporate resources that will be available to support its proposal.
   - **d)** References from its customers (with contact information) who are capable of documenting: the Company's ability to manage projects of comparable size and complexity; the quality and breadth of services provided by the Company.
2. The Company shall comply with Section 3.02 - AUTHORIZED PUBLIC UTILITIES and become recognized as an Authorized Public Utility with the MDOT SHA.
3. The Company shall be required to provide a bond or other performance surety before permitting any work within MDOT SHA right-of-way.
   - **a)** The amount of the bond or other performance security shall be based on the scope of the proposed work and/or as determined by the MDOT SHA.
4. The Company shall comply with all other requirements of this Utility Manual.
5. The Company shall not be in arrears in the payment of any obligations due to the State of Maryland, including the payment of taxes and employee benefits, and further that it shall not become in arrears during the term of its proposal if accepted and the agreement executed by the BPW.
   - **a)** The Company shall submit a signed Contract Affidavit with the signed agreement to the MDOT SHA in compliance with COMAR 21.07.01.25.

6.15.02 Technical Requirements

A) General Requirements For All Resource Sharing Projects

1. The Company shall refer to all RS Projects, where facilities are installed or modified, by MDOT SHA's approved reference for all communications, emails, correspondence, proposals, etc.
   - **a)** MDOT SHA's approved reference for Fiber Telecommunication Installations shall be the MD, US, or Interstate route number; or MDOT SHA's corridor reference with the beginning and ending termini points.

b) MDOT SHA's approved reference for using MDOT SHA's Infrastructure shall be the MDOT SHA's Infrastructure reference with the beginning and ending termini points or the MDOT SHA's site name.

c) MDOT SHA's approved reference for Wireless Telecommunication Sites shall be the MD, US, or Interstate route number with the nearest intersecting cross street; or MDOT SHA's facility reference name.

d) MDOT SHA's approved reference for Small Cell shall be the MD, US, or Interstate route number; or MDOT SHA's corridor reference with the nearest intersecting cross street; or if multiple sites along a route, with the beginning and ending termini points; or if grouped differently, referenced as agreed to by the MDOT SHA.

e) MDOT SHA's approved reference for using MDOT SHA Property shall MDOT SHA's facility name or the MDOT SHA's site reference name.

f) MDOT SHA's approved reference for other types of RS Projects shall be referenced as agreed to by the MDOT SHA.

2. All facilities installed on MDOT SHA rights-of-way or other MDOT SHA property shall be in accordance with all other requirements of this Utility Manual.

3. The Company's use of MDOT SHA rights-of-way or other MDOT SHA property shall be non-exclusive.

4. The Company shall be required to submit fully engineered plans, profiles, cross sections, and details in accordance with Section 2.02 - PLANS.

a) All preliminary design plans for tower construction shall be reviewed and approved by MDOT SHA's ITS Division Chief.

b) All final drawings for tower construction shall be reviewed and approved by MDOT SHA's RS Committee prior to obtaining a Utility Construction Permit.

5. The Company shall be required to create and maintain a master project file for every Fiber Telecommunication Installation; Wireless Telecommunication Site; or Other Type of RS Project where facilities are installed or modified. These project files shall contain all pertinent information regarding the installation, construction and/or modification of facilities, including a history of all engineering studies performed, plans, and any other information requested by the MDOT SHA. The Company shall provide a hard copy file and an electronic file to the MDOT, the MDOT SHA and other state agencies, as specified by the MDOT SHA.

a) The Company shall be required to obtain copies of all of MDOT SHA's right-of-way plats relating to each RS Project to be included with and as part of the master project file.

i. Information on obtaining copies of the MDOT SHA's right-of-wat plats can be found on the MDOT SHA website at https://www.roads.maryland.gov/mdotsha/pages/index.aspx?PageId=304

6. The Company shall comply with Section 3.04 - INDIVIDUAL WORK ORDER PERMITS and obtain:

a) A Utility Construction Permit for the installation, construction, removal, relocation, replacement, adjustment and/or significant maintenance of the Company's utility infrastructure/facilities as needed and/or requested by the Utility; **and**

b) A Utility Blanket Permit for routine operations, minor facility maintenance activities and emergency situations.

i. Utility Blanket Permits shall be obtained periodically as required by the appropriate district(s).

7. This manual does not confer any liability upon the MDOT SHA for any future cost of damage to, or relocation, or removal of the facility from the right-of-way or other MDOT SHA property. The MDOT SHA will not be liable for any damage costs arising from MDOT SHA construction, maintenance, and traffic activities within the highway right-of-way or other MDOT SHA property except as permitted by law.

8. The Company shall comply all with Federal, State, and local environmental requirements which shall include, but not limited to, the following departments and agencies:

- Maryland Department of Environment
- Maryland Department of Natural Resources
- Maryland Board of Public Works – Wetlands Administration
- U.S. Army Corps of Engineers

a) The Company shall provide copies of any environmental documentation, if required, to the MDOT SHA which may include, but not limited to, documentation related to the following:

- National Environmental Policy Act (NEPA)
- Erosion & Sediment Control (ESC)
- Storm Water Management (SWM)
- National Pollutant Discharge Elimination System (N.P.D.E.S)
- Notice of Intent (N.O.I)

9. The Company shall comply with CHAPTER 5: ENVIRONMENTAL REVIEW AND CONSTRUCTION INSPECTION.

10. All installations within MDOT SHA rights-of-way, on any other MDOT SHA owned property, and/or attachment to an MDOT SHA structure shall be of durable materials designed for long service life and relatively free from routine service and maintenance.

11. The disturbed work site area shall be restored to existing grades and materially to its original condition in accordance with Section 4.08 - RESTORATION. The extent of repairs or replacement shall be determined at the sole discretion of the MDOT SHA. Restoration activities shall commence within seven days of the completion of the construction activities.

B) Fiber Telecommunication Installation Resource Sharing Projects

1. New Fiber Installations

a) Fiber installations shall be restricted to areas where the MDOT SHA might otherwise install its own communication infrastructure.

b) All facilities shall be installed underground unless approved, in writing, by the MDOT SHA.

i. Depth of cover shall be in accordance with Section 6.10 – DEPTH OF COVER.

ii. Any support facilities allowed above ground within the access control limits, shall be in accordance with Subsection C - Wireless Telecommunication Installation.

iii. Any manholes, handholes, pull boxes, or junction boxes placed within MDOT SHA's rights-of-way shall comply with Section 2.01.03 - Aerial and Above Ground Facility Design Requirements.

c) Access to the facility shall be consolidated and designed for minimally disruptive access at selected points such as interchanges or major road crossings.

i. Service connections to adjacent properties shall not be permitted from longitudinal facility installations located within the access control lines of a freeway.

d) The facilities shall present no hazard to life, health, or property, should it fail to function properly, be severed or otherwise damaged.

e) Facilities shall be installed in a manner which will require minimum maintenance.

f) The maintenance, use, or future expansion of the highway facilities shall not be impaired and any cost to relocate the Company's facilities shall be borne by the Company.

g) Longitudinal facilities shall be installed outside the shoulder areas and as close to the right-of-way line as practical, taking into consideration the terrain and/or environmental constraints.

i. Installations within the median area may be considered where sufficient widths exist to safely install and maintain the facility.

ii. If it is necessary to place any part of the facility within the Clear Zone area, installation may be authorized, provided the Deputy Administrator/Chief Engineer for Operations approves the means of installation and imposes conditions for policing and other controls to protect highway users.

h) No part of the facility shall be allowed within the existing shoulders without an approved exception.

i. Refer to Section 2.07 – EXCEPTIONS for further guidance.

i) In addition to being in accordance with Section 2.02 - PLANS, plans, profiles, cross sections, and details for New Fiber Telecommunication installations shall include the following additional information:

- Company name
- MDOT SHA's reference for the Fiber Installation
- Counties and Municipalities as applicable
- Location of surrounding highways and streets (for alternate routes)
- Structures information as per Section 9.07 - STRUCTURES REVIEW PROCESS
- The entire proposed facility, in detail, showing exact locations and alignments with regards to existing highway features including offset dimensions (right or left) from the baseline line of the highway to the Fiber Telecommunication Installation.

- Proposed access points
- The locations of proposed manholes, handholes, etc.
- Complete typical sections, cross sections, construction details, conduit configurations, etc. including design criteria and material specifications
- Existing landscape (outline of vegetation) with landscaping to be proposed and/or trees to be removed
- Soil Erosion and Sediment Control plan and Storm Water Management Plan
- Existing traffic barriers (guardrail, jersey wall, etc.)
- Highway striping with lane and shoulder widths
- Dimensions from the right-of-way line to the edge of pavement
- Maintenance of Traffic plans - for construction and maintenance (provide a construction schedule and an "estimated" maintenance schedule)

2. <u>Use Of Existing Fiber Optic Infrastructure (Dark Fiber)</u>

a) The MDOT SHA has two main sources of acquiring fiber which the MDOT SHA uses to leverage for RS Projects. These sources are surplus fiber from fiber installed by the MDOT SHA to meet its IT needs (MDOT SHA Installed Fiber) and fiber obtained from previous RS projects (MDOT SHA Allocated Fiber).

b) It is MDOT SHA's preference to leverage this surplus of MDOT SHA Installed Fiber and MDOT SHA Allocated Fiber for other fiber and/or conduit from the Company (Company Shared Assets). The Company Shared Assets may also include any equipment necessary to make the Company's fiber operational for use by the MDOT SHA.

c) For Company Shared Assets, the Company shall comply with the following:

i. The Company shall, at its sole cost, procure and maintain all licenses, permits, and approvals required from:

- Applicable owners of poles and/or other utility infrastructure (and those having an interest in such poles and/or utility infrastructure) upon which or in which Company Shared Assets used by the MDOT SHA are or will be located; and
- Owners of property which is not owned by the State and the use of which or the access to which is required by the Company and/or the State for the Company or the State necessary to make the Company's fiber operational for use by the MDOT SHA; and
- Any governmental permits required in connection with the activities contemplated by the Company's proposal.

ii. The Company shall provide copies of such written licenses, permits, and approvals to the MDOT SHA.

iii. The Company shall keep all licenses, permits, and approvals with each company, and any other relevant existing licenses, permits, and approvals for pole attachments with any other company, current and in full force and shall pay all costs related thereto for the construction, reconstruction, installation, relocation, and repair (make-ready) of the existing poles and any additional poles.

iv. The Company shall provide the MDOT SHA with written consent from any other company to the installation of the attachments and/or utility infrastructure and to the right of the MDOT SHA to remain upon the poles, in the conduits, or on or in any other utility infrastructure owned or controlled by any other company upon the occurrence of certain events as described in Subsection 6.15.04 - Resource Sharing Agreements (D), (E), and/or (F).

d) For MDOT SHA Allocated Fiber to be accessed by the Company, the Company shall comply with the following:

i. As required by any relevant agreement of a previous MDOT SHA RS project, the Company shall pay any relevant fees (to the company of that previous MDOT SHA RSA) that may be required pursuant to the terms of that previous MDOT SHA RSA, for use of the MDOT SHA Allocated Fiber.

ii. The Company shall bear all costs associated with construction of any fiber laterals required to connect to the MDOT SHA Allocated Fiber to any Company fiber, including any charges imposed by any other company, from any relevant agreement of a previous MDOT SHA RS project, for splicing MDOT SHA Allocated Fiber into laterals for the Company's use.

e) The State's use, maintenance, future expansion of, or changes to MDOT SHA's highways shall not be subject to or impaired by the Company's use of MDOT SHA's Rights-of-way and/or other MDOT SHA owned property. Therefore, if all or any portion of the Company Assets must be moved, removed, repaired, or relocated, then all costs to move, remove, or relocate any or all portions thereof, shall be borne solely by the Company. In the event of the occurrence of such a move, removal, repair, or relocation, the MDOT SHA shall only be responsible for the costs and the performance of any necessary relocation of MDOT SHA's laterals and drops.

f) The Company shall pay all costs associated with splicing any Company fiber into any portion of the MDOT SHA Installed Fiber and/or MDOT SHA Allocated Fiber. In the event there is any damage to any portion of the MDOT SHA Installed Fiber and/or MDOT SHA Allocated Fiber caused in whole or in part by any act or failure to act of the Company or any of its employees, contractors, agents, or representatives, the Company shall be fully responsible for and shall pay for all repairs, replacements, etc. that are required.

g) In addition to being in accordance with Section 2.02 - PLANS, plans, profiles, cross sections, and details for Use Of Existing Fiber Optic Infrastructure (Dark Fiber) shall include the following additional information:

- Company name
- MDOT SHA's reference of the Existing Fiber Optic Infrastructure
- Counties and Municipalities as applicable
- Location of surrounding highways and streets (for alternate routes)
- The entire proposed facility, in detail, showing exact locations and alignments with regards to existing highway features including offset dimensions (right or left) from the baseline line of the highway to the Existing Fiber Optic Infrastructure.
- Proposed access points
- The locations of proposed manholes, handholes, etc.

3. Fiber Specifications

a) On each Segment, whether Existing State Fiber (fiber installed by the State and/or fiber allocated to the State) or Company Fiber (fiber installed by the Company and/or fiber allocated to the Company), the Company shall test all fibers in each direction using an Optical Time Domain Reflectometer (OTDR) configured for 1550 nm operation.

- **i.** The tests shall be performed at each lateral point of presence.
- **ii.** The Company shall provide the State five (5) hardcopies of the OTDR signal traces and two (2) soft copies of the OTDR signal traces on CD ROM media in a format acceptable to the MDOT SHA (on reel and installed).

b) The fibers provided to the State by the Company shall be the highest quality single mode fiber that meets or exceeds specifications stipulated by ITU G.826 (latest revision) for single mode fiber to operate in the 1550 nm wavelength window.

c) Fiber installed by the Company for the State shall meet or exceed specifications stipulated by ITU G.826 (latest revision) for single mode fiber to operate in the 1550 nm wavelength window.

d) All fiber splices shall be permanent fusion splices and shall meet the following splice standards:

- **i.** The loss value of a pigtail connector and its associated splice shall not exceed 0.50 dB. This value does not include the insertion loss from its connection to the FDP. For values greater than this, the splice shall be broken and re-spliced until an acceptable loss value is achieved.
- **ii.** During installation, the objective for each splice shall be a loss of 0.15 dB or less. If, after three attempts, the Company is not able to produce a loss value of less than 0.15 dB, then 0.25 dB will be acceptable. Each splicing attempt shall be documented on the data sheet.
- **iii.** During end-to-end testing of a span (a span shall be FDP to FDP), the objective for each spice shall be a bi-directional average loss of 0.15 dB or less. The actual measured value shall be documented on the data sheet.
- **iv.** The typical budget for each fiber span shall be calculated by using the following assumptions: average bi-directional loss of 0.10 dB or less for each spice, average bi-directional loss of 0.50 dB or less for each pigtail connector and its associated splice plus 0.22 dB/km @ 1550 nm or 0.25 dB/km @ 1625 nm for fiber attenuation. For example, if a given span is 100 km, has 10 splices and 2 pigtail terminations, each flow @ 1550 nm shall have total bi-directional loss of 21 dB or less [(10 splices x 0.10 dB) + (2 terminations x 0.50 dB) + 100 km X 0.22 dB) = 23 dB] Each individual splice may have a bi-directional loss of 0.15 dB or less, but the average bi-directional splice loss across the span shall be 0.10 dB or less.
- **v.** All Segments, including laterals, shall be protected from foreign voltage and grounded with an industry accepted system.
- **vi.** The fibers shall be rejected to the FDP with Ultra SC-PC connectors (typical return loss of 0.50 dB), unless another type of connector is specified by the authorized State Engineer. Pigtails shall be manufactured with Siecor standard single mode fiber or equivalent.

vii. Inspections will be conducted by the MDOT SHA District and/or the MDOT SHA's Office of CHART & ITS Development - ITS Division during construction to ensure Company compliance with these industry standards and the quality of the installation. The MDOT will notify the Company of the MDOT SHA's inspection results. Satisfactory results of final construction inspections are a prerequisite to final installation and final approval of the Permit for the Company to enter the MDOT SHA Permit Areas and access areas after initial installation.

C) Wireless Telecommunication Resource Sharing Projects

1. General Requirements

a) Numerous technical and site management factors must be considered during the planning and pre-construction phases of wireless communications locations.

b) Because published standards and specifications for wireless telecommunications, towers, facilities, etc., are constantly being revised and updated, it shall be the responsibility of the Company to research these standards and ensure compliance with the latest version.

c) The Company shall comply with and submit all applicable FCC and FAA applications and forms pertaining to site radio licensing applications, notice of proposed construction or alteration, etc., (currently FCC Form 600 and FAA Form 7460-1, latest revision).

d) The MDOT SHA desires to be a good neighbor to adjoining property owners and neighboring communities. The MDOT SHA may require the Company, at its sole expense, to:

i. Obtain any and all other permits or zoning approvals, if required;

ii. Organize; prepare materials, notifications, flyers, and handouts for; and conduct public hearings including any and all local government and community outreach.

e) The Company shall be responsible for conducting intermodulation studies and resolving all interference problems.

f) The Company shall be required to assume all costs for engineering, construction, structural modifications, permits, environmental impact, coverage, etc., required to construct new or additional wireless communications facilities and sites.

g) Ground mounted facilities shall be of a design compatible with the visual quality of the specific highway section being traversed.

i. All installations/facilities shall be designed to be as unobtrusive as possible and shall be reviewed and approved by the MDOT SHA's Office of Environmental Design.

h) Upon completion of the Utility Construction Permit requirements for the Site (tower construction, site construction, access road, etc. for new sites; or installation of antenna platforms, antennas, cabinets, shelters, etc. for existing sites), the Company shall certify in writing to the MDOT SHA that the construction is complete and ready for operational service.

i) Any wireless communication tower(s) constructed on MDOT SHA rights-of-way and/or on other MDOT SHA owned property shall be considered a state asset; as such, the Company shall transfer ownership of the tower to the MDOT SHA.

i. The Company shall submit a detailed cost of the tower construction to the MDOT SHA for reimbursement of the tower construction costs through partial abatements of the annual compensation due the State by the Company.

ii. Prior to construction, the Company shall submit material certifications **from the manufacturer(s)** for all steel and iron products (tower, antenna platforms, ice bridge, foundation rebar, cabinets, shelters, etc.) that will become or may become state property verifying that all steel and iron products meet Buy America Requirements.

A) Refer to Section 7.07.04 – Buy America Requirements for additional guidance.

B) The MDOT SHA shall require the Company to provide the material certifications as a condition of issuing the Utility Permit.

iii. The Company's equipment, for the Company's use, placed on the tower and the Company's equipment shelter shall remain the property of the Company.

iv. The tower shall be fully guaranteed against defects in materials and workmanship for a minimum period of two (2) years or the manufacturer's standard warranty period, whichever is longer, after installation and final acceptance by the MDOT SHA.

v. The Company shall submit a copy of the warranty for the tower and a Bill of Sale for the tower transferring ownership of the tower to the MDOT SHA within 30 calendar days of completion of construction of the tower.

j) In addition to being in accordance with Section 2.02 - PLANS, plans, profiles, cross sections, and details for Wireless Telecommunication RS Projects shall include the following additional information:

- Company name
- MDOT SHA's reference for the Wireless Telecommunication site
- Municipality and County
- Location of adjacent streets (for alternate access location)
- Location and setback of proposed structures (poles/monopoles/towers, shelters, and fencing) with the safety clear zone line (include calculation)
- Location utilities access (fiber optic, electrical, telephone, etc.)
- Block, lot number, and lot lines of adjacent lots (include tax map), include a copy of the municipal zoning map and a copy of any Wireless Telecommunication ordinance, if one exists.
- Height of the structure (pole/monopole/tower) and antenna elevation
- Existing landscape (outline of vegetation) with landscaping to be proposed and/or trees to be removed
- Location of existing and proposed access points, driveways, and parking areas
- Landscape plan, Soil Erosion and Sediment Control plan (include elevations, details showing Architectural treatment, colors of the various facility components, etc.)
- Existing traffic barrier (guardrail, jersey wall, etc.) - setbacks and proposed modifications if required
- Curb, sidewalks, etc. - existing and proposed

- Signs, regulatory, warning, directional, and private
- Curb opening, access width and alignment with respect to the highway
- Type of access construction (concrete, bituminous, gravel, pavers)
- Topographic contours - existing and proposed (50' around site)
- Highway striping with lane and shoulder widths
- Dimensions from the right-of-way line to the edge of pavement
- Distance to nearest traffic signal if less than 500 feet

2. New Macro (Towers/Monopoles) – Site Requirements

a) The Company shall take into consideration the topography, access safety, constructability, ease of tower erection, etc. when selecting sites for new wireless telecommunication facilities to propose to the MDOT SHA for review and approval.

b) Proposed sites are to be inconspicuous and safely located. In all cases the safest and least conspicuous location shall be selected.

c) Access roads for proposed sites shall comply with Section 4.08.04 - Private Entrances unless otherwise directed by the MDOT SHA.

i. Vehicular access will be carefully designed and controlled on a case by case basis, based upon the site location.

ii. The MDOT SHA may, at its sole discretion, require the Company to construct the access road with drivable grass pavers to discourage unauthorized access to the site.

d) Proposed site locations shall have sufficient space to accommodate placement and maintenance of equipment, cabinets or shelters, and generators for all users including reserved space for future users.

e) The MDOT SHA reserves the right to determine the optimal location for State communications equipment, cabinets, generators and/or shelters and to reserve that location within the site for immediate or future use, for its exclusive use, with no impact on other reserved State space within the site.

f) Proposed site locations shall have sufficient space to accommodate fencing for security.

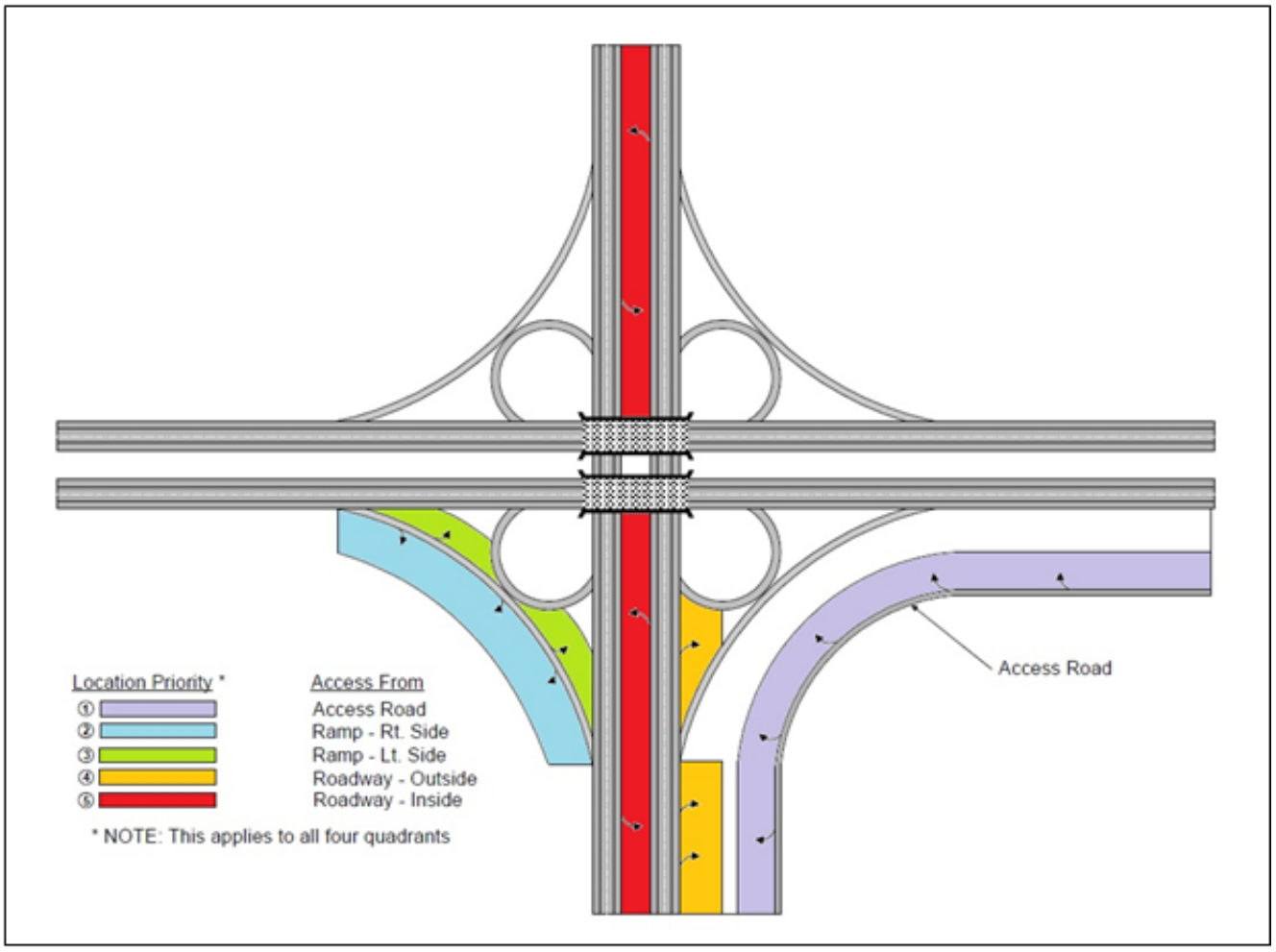
g) The Company shall provide and/or upgrade any utilities (electric and/or communication) sufficient to accommodate all users, including future users, **to** the site as part of the site construction.

h) New Macro (Towers/Monopoles) Sites Within Highway Rights-of-way

i. Proposed site locations shall meet the following requirements:

- Adequate sight distance for a safe ingress to and egress from the facility.
- Facilities shall not be located in areas which will interfere with sight distance of the traveling public in accordance with approved design and safety standards.
- The facility shall be located outside the clear zone and where they are unlikely to be struck unless shielding already exists.

ii. Adequate pull off area beyond the shoulder for construction and maintenance operations of the facility. Listed below, in descending order of preference, are site locations SHA will consider; justification must be provided to go to a lower priority. Refer to Figure 6.15.02 - Resource Sharing Location Priority for additional information.



(1) Vehicle access to the site can be obtained from outside the through roadway and connecting ramps (e.g. access from frontage roads or crossroads)
(2) Within interchange, vehicle access can be obtained from the right-hand side of the diagonal ramps.
(3) Within interchange, vehicle access can be obtained from the left-hand side of the diagonal ramps.
(4) Vehicle access from the outside shoulder of the mainline.
(5) Vehicle access from the inside shoulder (median side) of the mainline.

Figure 6.15.02 - Resource Sharing Location Priority

iii. Installations within the following areas can only be approved through joint MDOT SHA/FHWA concurrence:

- Inside Loop ramps under certain circumstances, this may be the best location
- Within any freeway weave areas less than 3/4 of a mile in length
- Any locations requiring new shielding

iv. Exceptions to the above provisions, which will not adversely affect safety or damage the State's facility, must be approved by the Deputy Administrator/Chief Engineer for Operations and FHWA.

3. <u>New Macro (Tower/Monopole) - Tower/Monopole Requirements</u>

a) The MDOT SHA strongly encourages only monopoles within MDOT SHA's Fully Controlled Access rights-of-way or MDOT SHA owned property under RS.

i. The MDOT SHA may consider other types of wireless communication towers such as guyed towers or lattice towers; however, the MDOT SHA reserves the right to unconditionally reject any other tower types at the MDOT SHA's sole discretion.

b) The proposed tower/monopole shall be designed to support telecommunications equipment for the Company, the State (planned or future equipment needs), and at least three (3) additional wireless telecommunication carriers.

i. The number of antennas, feed line types, and positions on the tower/monopole shall be determined.

ii. Reserved spaces and proposed antenna types for the reserved spaces shall be designated.

iii. The MDOT SHA reserves the right to determine the optimal location for State communications requirements and to reserve that location on the tower/monopole for immediate or future use for its exclusive use, with no impact on other reserved State antenna support space on the tower.

c) The Company shall obtain soil borings from the proposed tower/monopole site location.

i. Soil boring data shall be certified by a licensed State of Maryland Professional Engineer (PE).

ii. The State makes no representations as to sub-soil or sub-surface conditions at any site. The Company shall take each site "as is".

d) Tower/monopole base support structures shall be designed in accordance with all applicable Federal, State, local, and manufacturer's standards and requirements.

i. Penetration tests to measure compression, uplift, and lateral loads for foundation design shall comply with ASTM D1586.

ii. Tower/monopole base support structures shall be certified by a licensed State of Maryland Professional Engineer (PE).

e) Tower/monopole base support structure designs and soil boring data shall be submitted to the MDOT SHA for review and approval.

f) The proposed tower/monopole shall meet or exceed the latest design, fabrication, and wind loading standards for site locations and weather of EIA/TIA-222 standards.

i. The proposed tower/monopole must be designed for, as a minimum, 90 mile per hour winds with a 1/2" coating of radial ice.

ii. The MDOT SHA reserves the right to specify more stringent design criteria.

iii. The design drawings and structural analysis reports for the tower/monopole shall be submitted to the MDOT SHA for review and approval.

iv. The design drawings shall be certified by a licensed State of Maryland Professional Engineer (PE).

g) The structural analysis shall be certified by a licensed State of Maryland Professional Engineer (PE).

i. All structural analysis shall require an onsite (field) investigation.

ii. The Telecommunication Company shall be required to verify the structure or land's condition prior to installation of any proposed equipment.

iii. If actual conditions differ from those described by the Engineer in either an analysis, study, or prints, the Telecommunication Company shall notify the engineering firm immediately and have the Engineer revise any analysis, studies, prints, or any other documents which are to be submitted to the MDOT SHA.

h) The tower/monopole shall be hot dipped galvanized following ASTM A123/A123M.

i) Anchor bolts shall meet or exceed the latest version of ASTM A325.

j) The tower/monopole, antennas, equipment, transmission lines, etc. shall be grounded in accordance with accepted engineering practices; equipment manufacturer's recommendations; and in accordance with the latest requirements of the National Electric Code and National Electric Safety Code.

i. Particular attention shall be given to waterproofing connectors and cable splices.

ii. Proper and thorough grounding methods shall be employed to provide maximum protection from lightning hazards.

k) The Company shall comply with all applicable FCC and FAA rules and regulations pertaining to construction, marking and lighting of antenna structures, objects affecting navigable airspace, etc., (currently CFR 47 Part 17 and CFR 14 Part 77, latest revision).

i. All tower/monopole lighting equipment including, but not limited to, optical sensors and medium-intensity white strobe lights shall meet current FCC and FAA lighting requirements. All lighting and sensors shall be approved by the MDOT SHA.

4. Collocating on Existing Macro Towers/Monopoles

a) The Company shall comply with all the requirements, as applicable, of Subsection 6.15.02 (A) General Requirements For All Resource Sharing Projects and Subsection 6.15.02 (C)(1) General Requirements for Wireless Telecommunication RS Projects.

b) The Company shall submit complete design drawings showing the proposed elevation/location on the tower/monopole; the number (quantity), model & size of the antennae to be installed on the tower; and number (quantity) & size of feed lines; to the MDOT SHA for review and approval.

i. The drawings shall be certified by a licensed State of Maryland Professional Engineer (PE).

c) The Company shall submit complete design drawings and structural analysis reports for the tower/monopole to the MDOT SHA for review and approval.

i. The tower/monopole with the Company's proposed equipment added shall meet or exceed the latest design, fabrication, and wind loading standards for site locations and weather of EIA/TIA-222 standards.

ii. The tower/monopole must be designed for, as a minimum, 90 mile per hour winds with a 1/2" coating of radial ice.

iii. The MDOT SHA reserves the right to specify more stringent design criteria.

iv. The structural analysis shall be certified by a licensed State of Maryland Professional Engineer (PE).

d) RS Towers/Monopoles – are towers constructed under RS projects.

i. The MDOT SHA reserves the right to determine the optimal location for State communications requirements; to reserve that location on the tower/monopole and to reserve that ground space at the site.

e) MDOT SHA Public Safety Towers – are towers constructed by the MDOT SHA or other governmental entities.

i. Because of the public safety nature of the MDOT SHA and other governmental facilities; and the need for secure, reliable communications; use of these sites will generally not be allowed. On the rare occasion that a collocation would be permitted, the Company shall be required to meet strict criteria, at the Company's sole cost, for site security, engineering services, and construction.

ii. Any proposed installations on an MDOT SHA Public Safety Tower require a technical sufficiency review and approval by the State Infrastructure Executive Committee (SIEC) – Technical Subcommittee.

A) The Company shall provide the Assistant Division Chief, Office of CHART & ITS Development, ITS Division a copy(ies) of the proposed installations for submittal to SIEC Technical Subcommittee for its review.

B) Upon approval from SIEC Technical Subcommittee, the Company may submit its RS Proposal to the MDOT SHA and/or the MDOT for review.

iii. The Company shall comply with all the requirements of Subsection 6.15.02 (C)(2)(h) Sites on MDOT - Owned Property (non-highway rights-of-way)

5. Modifications on Existing Macro Towers/Monopoles and/or at Existing Macro Wireless Telecommunication Sites

a) The Company shall comply with all the requirements, as applicable, of Subsection 6.15.02 (A) General Requirements For All Resource Sharing Projects and Subsection 6.15.02 (C)(1) General Requirements for Wireless Telecommunication RS Projects.

b) The Company shall submit complete design drawings showing the proposed elevation/location on the tower/monopole; the number (quantity), model & size of the antennae to be installed on the tower/monopole; and number (quantity) & size of feed lines; to MDOT SHA's ITS Division Chief for review and approval.

i. The drawings shall be certified by a licensed State of Maryland Professional Engineer (PE).

c) The Company shall submit complete design drawings and structural analysis reports for the tower/monopole to the MDOT SHA for review and approval.

i. The tower/monopole with the Company's proposed equipment added shall meet or exceed the latest design, fabrication, and wind loading standards for site locations and weather of EIA/TIA-222 standards.

ii. The tower/monopole must be designed for, as a minimum, 90 mile per hour winds with a 1/2" coating of radial ice.

iii. The MDOT SHA reserves the right to specify more stringent design criteria.

iv. The structural analysis shall be certified by a licensed State of Maryland Professional Engineer (PE).

d) The Company shall submit a letter with the design drawings and structural analysis requesting the proposed modifications and summarizing all the Company's proposed work and modifications on the tower and/or at the site.

e) The MDOT SHA will review the Company's request, design drawings, and structural analysis reports along with the Company's existing RSA.

i. If the MDOT SHA determines, at its sole discretion, that the Company's request does not alter or materially change the existing Company's RSA, and which does not require a modification in the monetary compensation; and the MDOT SHA approves the Company's design drawings and structural analysis reports; the MDOT SHA will allow the Company to obtain a Utility Construction Permit from the district and proceed with the modifications.

ii. If the MDOT SHA determines, at its sole discretion, that the Company's request does alter or materially change the existing Company's RSA which does require a modification in the monetary compensation, the MDOT SHA shall require the Company to submit a new RS Proposal to revise the Company's existing RSA with the MDOT SHA.

6) Micro (Small Cell – New or Collocation) Wireless Telecommunication Sites Along Highway Rights-of-way

i. As of the date of this Utility Manual, Micro Wireless is an emerging technology. As such, all Micro Wireless Sites shall comply with the requirements of Section 6.16.01 - Distributed Antenna Systems.

ii. All Micro Wireless Sites shall comply with the requirements of Section 2.01 - DESIGN and CHAPTER 6: ACCOMMODATION

iii. In addition to being in accordance with Section 2.02 - PLANS, any plans, profiles, cross sections, and details for Micro (Small Cell – New or Collocation) Wireless Telecommunication Sites shall include the following additional information:

- MDOT SHA's reference for the Small Cell Site(s)
- All other requirements as stated previously for the Wireless Telecommunication Plans

D) Telecommunication Resource Sharing Projects on MDOT SHA - Owned Property (non-highway rights-of-way)

1. Because of the public safety nature of MDOT facilities; and the need for secure, reliable operation of these sites; construction of new wireless telecommunication towers and sites on MDOT - owned property such as District Offices, Maintenance Shops, Salt Barns, etc. shall require additional coordination with the local MDOT manager of the facility.

2. The Company shall be required to coordinate all construction activities, antenna installations, maintenance activities, modifications, and removals so as to not interfere or otherwise disrupt any MDOT activities or operations at these locations.

3. Security to MDOT SHA's facilities shall be controlled by the local MDOT manager of the facility. Security keys or passes, magnetic keyed (or similar) security gates, video surveillance, etc. may be required at MDOT sites.
4. If a site and facility installation plan for an existing MDOT facility does not exist, the Company shall develop one to include present and proposed equipment. The MDOT may require the Company to make recommendations for site and facility expansion to accommodate future communications systems proposed by the MDOT or a potential carrier. All such plans shall become the property of the State.
5. In addition to being in accordance with Section 2.02 - PLANS, plans, profiles, cross sections, and details for Telecommunication RS, Projects on MDOT SHA- Owned Property (non-highway rights-of-way) shall include the following additional information:
    - Company name
    - MDOT SHA's reference for the MDOT SHA Property
    - Municipality and County
    - Location of adjacent streets (for alternate access location)
    - Location and setback of proposed structures (monopoles/towers, shelters, and fencing) from property lines, if applicable
    - Location and placement proposed structures (monopoles/towers, shelters, and fencing) on MDOT property and/or MDOT buildings/structures, if applicable
    - Location utilities access (fiber optic, electrical, telephone, etc.)
    - MDOT building/structure plans and details including structural details, if applicable
    - Block, lot number, and lot lines of adjacent lots (include tax map), include a copy of the municipal zoning map
    - A copy of the local cell tower ordinance, if one exists and if applicable.
    - Height of the structure (monopole, tower, shelters, etc.) and antenna elevation, if any and if applicable
    - Existing landscape (outline of vegetation) with landscaping to be proposed and/or trees to be removed
    - Location of existing and proposed access points, driveways, and parking areas
    - Landscape plan, Soil Erosion and Sediment Control plan (include elevations, details showing Architectural treatment, colors of the various facility components, etc.)
    - Curb, sidewalks, etc. - existing and proposed
    - Signs, regulatory, warning, directional, and private
    - Curb opening, access width and alignment with respect to the highway
    - Type of access construction (concrete, bituminous, gravel, pavers)
    - Topographic contours - existing and proposed (50' around site)

6.15.03 Resource Sharing Proposals

A) General Information & Requirements

1. It is the intent of the MDOT SHA to consider all proposals and to accept offers that will be in the best interests of the State. The State reserves the right, in its sole discretion, to accept any offer that is deemed to provide the best value to the State. Conversely, the State reserves the right, in its sole discretion, to reject offers that are deemed not to provide sufficient value to the State.

2. The MDOT SHA is required to establish and maintain a State highway system and the highway rights-of-way that are devoted exclusively to public transportation purposes. As such there is nothing in this Section 6.15 - RESOURCE SHARING or this Utility Manual that obligates or requires the State to review, consider, or accept any RS proposal. The State reserves the right, in its sole discretion, to unconditionally refuse to review, consider, or accept any RS proposal.

a) Refer to Section 1.05.01 - Maryland Law – MDOT SHA for additional information.

3. Examples of proposals of interest to the State include but are not limited to:

- Surplus dark fiber optic cables for the exclusive of the MDOT SHA for its own use or for the MDOT SHA to leverage for other RS opportunities;
- Cash payments for the use of MDOT SHA resources;
- Transmission facilities or bandwidth for use in conjunction with the CHART program and the networkMaryland™;
- Connection of State facilities near highway rights-of-way and to MDOT SHA's ITS devices;
- Electronics, equipment, and connectivity required to make fiber optic cable installed by the Company(s) for the use of the State fully operational and functional;
- Transmission facilities or bandwidth for communications services for applications such as wide area data networking, voice services, video teleconferencing, video distance learning, Internet access, etc.;
- Reduction of the MDOT SHA’s communications costs;
- Maintenance and management of facilities installed by the Company(s) for use by the MDOT SHA,
- Any other consideration offered by the Company and deemed to be of value to the MDOT SHA.

4. Proposals should be prepared simply and economically, providing a straightforward, concise description of the Company's proposal to meet the requirements of this Section 6.15 - RESOURCE SHARING.

a) The MDOT SHA shall not be responsible for any costs incurred by the Company in preparing and submitting a proposal, in preparing plans or in performing any other activities related to RS.

5. The Company may submit multiple proposals. Likewise, the State may consider multiple proposals from multiple companies. The MDOT SHA RS Committee will determine if and/or which proposals are in the best interests of the State. The Company shall coordinate their work with the efforts of others in good faith.

6. The Company should identify those portions of its proposal that it considers confidential, proprietary information, or trade secrets, and provide justification why such materials, if requested, should not be disclosed by the State under the Access to Public Records Act (PIA), Title 10, Subtitle 6, of the State Government Article of the Annotated Code of Maryland. The Company is advised that, if there is a request for this information under a PIA, the MDOT SHA will make the final determination, to the extent of the law.

B) Proposal Format

The Company shall submit proposals in four parts:

Part I – Executive Summary
Part II – Value to the State Estimate
Part III – Concept Plans/Technical Drawings
Part IV – Right-of-Way Plats or Property Plats (if requested by MDOT SHA)

Part I - Executive Summary

1. The Executive Summary shall condense and highlight the contents of the Proposal including the benefits to the Maryland economy and a summary of the Value to the State Estimate. The Executive Summary shall provide a broad overview of the contents of the entire proposal.
2. Examples of some of benefits the State of Maryland economy may include:
   - The estimated percentage of contract dollars to be recycled into Maryland's economy in support of this proposal, through the use of Maryland subcontractors, suppliers, and joint venture partners;
   - The estimated number and types of jobs for Maryland residents resulting from this proposal;
   - Tax revenues to be generated for Maryland and its political subdivisions as a result of this proposal;
   - The estimated percentage of subcontract dollars committed to Maryland small businesses and MBEs.

Part II - Value to the State Estimate

1. The Company shall submit a "Value to the State Estimate" as Part III to the Proposal which shall be a full itemization (e.g. monetary compensation, equipment, services, etc.) of the items that comprises the total value of its offer to the State.
2. The Company may be required to have an independent third-party firm or consultant provide a certified statement of the economic value for their "Value to the State Estimate." This certification, if required, shall include a detailed explanation of how that value was calculated.

Part III - Concept Plans/Technical Drawings

1. While concept plans and technical drawings are to be prepared simply and economically for submittal of the Company's proposal, sufficient detail needs to be provided to completely describe the entire proposal visually.
2. Upon approval of DoIT, the Company shall be required to submit all items in accordance with Section 6.15.02 - Technical Requirements including fully engineered plans for review and approval of the MDOT SHA.

C) Fiber Installation Proposals

1. When formulating Fiber Installation proposals, the Company shall consider and specifically address the following additional items in the proposal:
   - Proposed route map with sufficient detail to see intersecting streets and names.
   - Proposed access points. (Manholes, handholes, etc.)

- Supporting equipment/cabinets/shelters (above ground facilities) including any special considerations.
- Preliminary typical cross sections, details, etc.
- Requested term of the agreement.
- Fiber or conduit offered to the MDOT SHA, if applicable.
- Monetary compensation offered to the MDOT SHA, if applicable.

2. The monetary value for new Fiber installation proposals shall be determined by DoIT to determine the fair market value of fiber within MDOT SHA rights-of-way. Refer to DoIT Fiber Optics Resource Sharing - Standard Pricing Schedule on MDOT SHA's website at https://www.roads.maryland.gov/OOC/Fiber-Resource-Sharing-Standard-Pricing-Schedule.pdf for additional guidance.

a) Refer to FHWA's Rural Interstate Corridor Communications Study Report to States; APWA's Valuation of Street Rights-of-Way for Telecommunications Facilities at http://www2.apwa.net/documents/organization/row-va1.pdf for additional information.

b) The monetary value determined by DoIT shall be used in the Company's "Value to the State Estimate" for Fiber Installation proposals.

D) Use Of Existing Fiber Optic Infrastructure (Dark Fiber)

1. The MDOT SHA has surplus fiber infrastructure at various locations across the State either from previous RS projects (MDOT SHA Allocated Fiber) or installed by the MDOT SHA (MDOT SHA Installed Fiber). The MDOT SHA has used this surplus fiber infrastructure for additional RS projects. It is the intent and preference of the MDOT SHA to leverage this surplus for other fiber and/or conduit from the Company if the MDOT SHA deems the proposal to provide the best value to the State.

2. When formulating proposals for use of MDOT SHA's existing fiber optic infrastructure, the Company shall consider and specifically address the following additional items in the proposal:

- Proposed route map with sufficient detail to see intersecting streets and names of the fiber and/or conduit offered to the MDOT SHA.
- Proposed access points (Manholes, handholes, etc.) to MDOT SHA's fiber.
- Supporting equipment/cabinets/shelters (above ground facilities) including any special considerations.
- Preliminary typical cross sections, details, etc.
- Requested term of the agreement.
- Fiber or conduit offered to the MDOT SHA, if applicable.
- Monetary compensation offered to the MDOT SHA, if applicable.

3. The monetary value for use of MDOT SHA's existing fiber optic infrastructure (Dark Fiber) proposals shall be determined by DoIT to determine the fair market value of fiber within MDOT SHA rights-of-way. Refer to DoIT Fiber Optics Resource Sharing - Standard Pricing Schedule on MDOT SHA's website at https://www.roads.maryland.gov/OOC/Fiber-Resource-Sharing-Standard-Pricing-Schedule.pdf for additional guidance.

a) The monetary value determined by DoIT shall be used in the Company's "Value to the State Estimate" for the Use of MDOT SHA's Existing Fiber Optic Infrastructure proposals.

E) Macro Wireless (Towers/Monopoles – New & Collocation) Telecommunications Proposals

1. When formulating Macro Wireless (Towers/Monopoles – New & Collocation) Telecommunications Proposals, the Company shall consider and specifically address the following additional items in the proposal:

- Proposal site location with physical address and latitude & longitude.
- Collocate or new build.
- Height of existing or proposed new tower.
- Number, model, size of antennae to be installed on the tower.
- Number and size of feed lines.
- Power & telecom availability/requirements including any special considerations.
- Preliminary site plan showing tower, requested ground space, equipment pad for the shelter or cabinets, proposed access to the site, etc.
- Requested term of the agreement.
- Monetary and in-kind compensation offered to the MDOT SHA.

2. The monetary value for Macro Wireless (Towers/Monopoles – New & Collocation) Telecommunication Proposal shall be determined from the Department of Information Technology's (DoIT) Tower Resource Sharing - Standard Pricing Schedule (latest revision), of antenna types and Average Daily Traffic (ADT) volumes.

a) The ADT is determined from the Maryland highways surrounding the proposed wireless telecommunication location.

b) The ADT's for Maryland highways may be found on MDOT SHA's Traffic Volume Maps by County**.**

c) The DoIT Macro Wireless (Towers/Monopoles) - Standard Pricing Schedule may be found on MDOT SHA's website at https://www.roads.maryland.gov/OOC/Macro_Cell_on_Tower_Resource_Sharing-Standard_Pricing_Schedule_Ver_03-29-2019.pdf.

d) The monetary value determined from this matrix shall be used in the Company's "Value to the State Estimate" for Macro Wireless (Towers/Monopoles – New & Collocation) Telecommunication Proposals.

F) Micro Wireless (Small Cell – New & Collocation) Telecommunications Proposals

1. When formulating Micro Wireless (Small Cell) Telecommunications Proposals, the Company shall consider and specifically address the following additional items in the proposal:

- Proposal site location with physical address and latitude & longitude.
- Collocate on existing pole or new pole.
- Height of existing pole or proposed new pole.
- Number, model, size of antennae to be installed on the pole.
- Number and size of feed lines.

- Power & telecom availability/requirements including any special considerations.
- Preliminary site plan showing pole, requested ground space, equipment pad for the equipment, proposed access to the site, etc.
- Requested term of the agreement.
- Monetary and in-kind compensation offered to the MDOT SHA.

2. The monetary value for Micro Wireless (Small Cell) Telecommunications Proposals shall be the Annual Fee(s) For Micro Wireless (Small Cell) Antennas or Attachments for the term of the proposal as determined from the Department of Information Technology's (DoIT) Small Cell Resource Sharing Pricing Schedule (latest revision) on MDOT SHA's website at https://www.roads.maryland.gov/OOC/Small_Cell_Resource_Sharing_FCC_Standard_Pricing_Schedule_rev_Aug2019.pdf.

a) The Application Fee(s) is a one time/non-recurring fee for reviewing the Company's Micro Wireless (Small Cell) Antennas or Attachments proposal and shall not be included in the monetary value for the proposal.

i. Refer to DoIT's Small Cell Rate for the Application Fee(s).

b) Annual Fee(s) (recurring fees each year) For Micro Wireless (Small Cell) Antennas or Attachments

i. Refer to DoIT Small Cell Rate for the Annual Fee(s)

d) Rates for Micro Wireless (Small Cell) Telecommunications Proposals include only 150 feet of fiber laterals necessary to support the project. Additional fiber charged at the DoIT Fiber Rate.

e) The monetary value shall be used in the Company's "Value to the State Estimate" for Wireless Telecommunication Collocation proposals.

G) MDOT SHA Property (non-highway rights-of-way) Telecommunications Proposals

1. When formulating Wireless Telecommunications proposals, the Company shall consider and specifically address the following additional items in the proposal:

- Proposal site location with physical address and latitude & longitude.
- Proposed fiber route map with sufficient detail to see intersecting streets and names, if applicable.
- Collocate or new build, if applicable.
- Height of existing or proposed new tower, if applicable.
- Number, model, size of antennae to be installed on the tower, if applicable
- Number and size of feed lines, if applicable.
- Preliminary site plan showing location and placement proposed structures/facilities (monopoles/towers, shelters, fiber, fencing, etc.) on MDOT property and/or MDOT buildings/structures including any special considerations.
- Proposed access points (Manholes, handholes, etc.), if applicable.
- Location utilities access (fiber optic, electrical, telephone, etc.) including any special considerations.

- Requested term of the agreement.
- Fiber or conduit offered to the MDOT SHA, if applicable.
- Monetary compensation offered to the MDOT SHA, if applicable.

2. The monetary value for MDOT SHA Property (non-highway rights-of-way) Telecommunications Proposals shall be determined from the Department of Information Technology's (DoIT) Land Rates - Standard Pricing Schedule (latest revision) (DoIT Land Rates) on MDOT SHA's website at https://www.roads.maryland.gov/OOC/Non-Highway_RW_Land_Resource_Sharing-Standard_Pricing_Schedule_rev2019.pdf

a) Each Site shall consist of a maximum area of (i) 200 square feet for a building or (ii) 2,500 square feet for land.

b) The monetary value shall be used in the Company's "Value to the State Estimate" for MDOT SHA Property (non-highway rights-of-way) Telecommunication Proposals.

6.15.04 Resource Sharing Agreements

A) All agreements/contracts with the State are subject to the requirements of the Annotated Code of Maryland. These mandatory provisions, as required by law, shall not be subject to negotiation.

B) For Wireless Agreements, the fixed assets of the Company, e.g. antenna platform, Ice Bridge, equipment shelter, backup generator, etc., may be negotiated by the Company and the MDOT SHA to remain at the site and become the property of the State (at no cost to the State) at the termination of the agreement.

6.15.05 Resource Sharing Process – Over $100k

A) Resource Sharing Proposal Submittal & DoIT Valuation

1. Companies submit proposals to the State in a variety of ways. The MDOT SHA RS Committee is the initial point of contact for review and coordination with other stakeholders involving MDOT SHA rights-of-way, existing MDOT SHA infrastructure, or MDOT SHA owned property.

a) Proposals for MDOT SHA received directly by MDOT TSO or DoIT should be forwarded to MDOT SHA RS Committee.

2. Each proposal received may be reviewed and considered by MDOT SHA's RS Committee.

a) The MDOT SHA RS Committee is comprised of the following members:

- MDOT SHA Office of Construction (OOC) - Statewide Utilities Engineer – Coordinates technical reviews/comments among MDOT SHA Districts and Design Offices.
- MDOT SHA Office of CHART & ITS Development - ITS Division Chief – Reviews agreements pertaining to Intelligent Transportation Systems.
- MDOT SHA Office of CHART & ITS Development - ITS Division Statewide Engineering & Technical Support – Reviews all proposals for technical sufficiency and technical standards

b) The MDOT SHA RS Committee may request any additional technical, legal, or other assistance from any source that the Committee deems appropriate.

3. The MDOT SHA RS Committee will generally meet with the Company to discuss all technical and economic value aspects of their proposal in order to clearly understand the proposal.

a) This meeting can occur, but not necessarily required, either before or after the Company submits their proposal.

4. After the Company submits their RS Proposal, the MDOT SHA RS Committee will consider both the technical and economic value factors set forth in the proposal.

a) If the proposal is to install a facility on an MDOT SHA Public Safety Tower, the Company shall complete a Tower & Shelter Request Form for review and approval by the State Infrastructure Executive Committee (SIEC) – Technical Subcommittee.

i. The Company shall submit the form to MDOT SHA CHART, ITS Division - Chief for submittal to SIEC Technical Subcommittee for its review.

ii. The Tower & Shelter Request Form can be downloaded from the MDOT SHA's website at https://www.roads.maryland.gov/OOC_Forms/Request%20for%20Tower%20Shelter%20Space%20v053007.doc

b) Should the MDOT SHA RS Committee determine that it is in the State's best interest to proceed with the RS proposal; the MDOT SHA RS Committee will send the Company's RS Proposal to the MDOT TSO's RS Committee.

5. Each proposal received will be reviewed and considered by MDOT TSO's RS Committee.

a) The MDOT TSO RS Committee is comprised of the following members:

- MDOT TSO Resource Share Administrator – Facilitates Committee meetings and negotiations between MDOT SHA and Private Sector entities relating to telecommunications
- MDOT Enterprise/RSA Fiber Coordinator - Reviews all fiber optic proposals for MDOT/TBU needs; technical sufficiency; and technical standards
- MDOT TBU Representatives - Coordinates technical reviews/comments among within their respective TBU
- MDOT SHA Office of Construction (OOC) - Statewide Utilities Engineer – Coordinates technical reviews/comments among MDOT SHA Districts and Design Offices
- MDOT SHA Office of CHART & ITS Development- ITS Division Engineering & Technical Support – Reviews all proposals for technical sufficiency and technical standards
- MDOT SHA CHART, ITS Division - Chief – Reviews agreements pertaining to Intelligent Transportation Systems

b) The RS Committee may request any additional technical, legal, or other assistance from any source that the Committee deems appropriate.

c) The MDOT TSO Resource Share Administrator:

i. Requests MDOT TBU's, DoIT, DNR, etc. to review and comment on the Company's proposed RS project for current or potential future RS needs and/or opportunities; and

ii. Compiles any needs and/or requests and prepares a Needs & Requests Summary for the MDOT TSO RS Committee; and

iii. Updates the RSA database; and

iv. Forwards the proposal to DoIT's State Resource Sharing Manager for determination of the value and comments.

B) Initial Review

1. Upon receipt of the DoIT's State Resource Sharing Manager's determination of the value and comments, the MDOT TSO Resource Share Administrator will forward DoIT's information and the Needs & Requests Summary to the MDOT SHA RS Committee.

2. The MDOT SHA RS Committee Lead will request other MDOT SHA offices to review and comment on the Company's proposed RS project for current or potential future RS needs and/or opportunities. These offices may include, but not limited to:

- MDOT SHA Office of Preliminary Planning and Engineering Data Services Engineering Division,
- MDOT SHA Office of CHART & ITS Development
- MDOT SHA Office of Traffic & Safety

a) The MDOT SHA RS Committee Lead will compile any needs and/or requests and prepares a summary for the MDOT SHA RS Committee

b) The MDOT SHA RS Committee Lead is assigned by the MDOT SHA RS Committee based on the type of RS Proposal submitted by the Company.

3. Upon receipt of the DoIT's proposal valuation and comments, the MDOT SHA RS Committee Lead will begin the Initial Review and the Agreement Preparation & Negotiation.

a) The Initial, Field, and Technical Reviews may be performed concurrently with the Agreement Preparation & Negotiation.

4. The MDOT SHA RS Committee Lead requests other MDOT SHA offices to review and comment on the Company's RS proposed routes or sites:

a) Office of Real Estate (ORE) – review if the right-of-way or property is MDOT SHA's; any title restrictions; review if the right-of-way or property was purchased as a scenic enhancement/landscape parcel; or any other existing restrictions of its use or other information in ORE's files that would raise a potential concern.

b) Office of Preliminary Planning and Engineering (OPPE) – review for possible conflicts with future highway or bridge projects.

c) Office of Highway Development (OHD) – review for possible conflicts with current and/or future highway projects.

d) Office of Structures (OOS) – review for possible conflicts with current and/or future bridge projects.

e) MDOT SHA's District Office(s) – review for possible conflicts with what is proposed; and potential interference with district maintenance operations and/or maintenance contracts.

5. The MDOT SHA RS Committee Lead will compile a summary of comments received for the MDOT SHA RS Committee.

a) If the initial review from MDOT SHA's offices is unfavorable, the MDOT SHA RS Committee Lead will contact the Company regarding MDOT SHA's comments.

i. The Company may submit revised plans, or an alternate route/site for review to the MDOT SHA RS Committee Lead.

ii. If the Company is unable or willing to submit revised plans, or an alternate route/site, the Company's RS proposal is rejected.

C) Field Review

1. If the initial review is favorable, the MDOT SHA RS Committee Lead will set up and conduct a field review of the Company's proposed route or site.

a) The field review consists of MDOT SHA's OOC Utilities representative(s), the District Utility Engineer from the appropriate district(s), MDOT SHA's Office of CHART & ITS Development - ITS Division representative(s), and Company representative(s).

i. MDOT TSO's Resource Sharing Administrator, MDOT TSO's OTTS Fiber Coordinator, Federal Highway representative(s) and/or others may be invited to the meeting if necessary.

ii. Proposed routes or sites within the Interstate/NHS highway system right-of-way may require FHWA comments and/or concurrence.

b) At the field review, the criteria for placement of the proposed utility facilities shall be evaluated as per the MDOT SHA's Utility Manual, Chapter 6, Utility Accommodation, Subsection 6.15 – RESOURCE SHARING. Additional criteria may be considered depending on the type of facilities proposed and on-site conditions.

i. Potential macro wireless communication site locations will be reviewed for ease of tower erection, site access, power and telecom availability, construction constraints, neighboring buildings and environmental impact.

ii. Potential new fiber installation routes will be reviewed for constructability/constraints, compliance to MDOT SHA's Utility Manual, and environmental impact. Alternate routes may be suggested or recommended.

c) The MDOT SHA RS Committee Lead will request all who were in attendance at the field meeting to prepare written comments for the MDOT SHA RS Committee.

i. The MDOT SHA RS Committee Lead will compile and prepare a written summary of the comments for the MDOT SHA RS Committee.

2. The MDOT SHA RS Committee reviews the summaries of the initial review and the field meeting from the MDOT SHA RS Committee Lead.

a) If the field meeting is unfavorable, the MDOT SHA RS Committee Lead will contact the Company regarding MDOT SHA's comments.

i. The Company may submit revised plans, or an alternate route/site for review to the MDOT SHA RS Committee Lead.

ii. If the Company is unable or willing to submit revised plans, or an alternate route/site, the Company's RS proposal is rejected.

D) Technical Review

1. If the Initial and Field Review are favorable, the MDOT SHA RS Committee Lead will begin the Technical Review.
   a. The MDOT SHA RS Committee Lead will request fully engineered technical plans from the Company for the Technical Review.
2. Upon receipt of the fully engineered technical plans from the Company, the MDOT SHA RS Committee Lead will forward copies of the fully engineered technical plans from the Company to various MDOT SHA offices for review and comment depending on the type of facility (Fiber installation or wireless telecommunication).
   a) For new fiber optic installations or use of existing MDOT fiber infrastructure, the following offices review and comment, if required:
      i. MDOT SHA's OOC Utilities Division – Reviews and approves all plans and documentation for technical sufficiency and compliance with requirements.
      ii. MDOT SHA's Office of CHART & ITS Development - ITS Division – Reviews and approves all plans, equipment, and materials (fiber, electronics, etc.) for technical sufficiency and technical standards.
      iii. MDOT SHA's Office of Structures - Reviews all plans, and materials to determine if the proposed facilities would interfere with a structure's maintenance, inspection, operations, structural integrity, or aesthetics. Any attachments to structures shall be reviewed and approved by Office of Structures. Refer to Section 9.05 - ATTACHMENTS TO HIGHWAY STRUCTURES for further guidance.
      iv. MDOT SHA's Office of Environment - Reviews the Companies environmental commitments and documents for compliance.
      v. MDOT SHA's Office of Traffic and Safety - Reviews all plans to determine any potential conflicts with existing traffic facilities. (signs, signals, etc.)
      vi. MDOT SHA's District Office(s) – Maintenance Section to reviews all plans to determine any potential conflicts with existing maintenance facilities. (drainage structures, underdrains, lighting, etc.) Utilities Section to review for possible conflicts with what is proposed.
      vii. MDOT TSO's Enterprise/RSA Fiber Coordinator – Reviews and approves all plans, equipment, and materials (fiber, electronics, etc.) for technical sufficiency and technical standards.
   b) For macro (cell towers) or micro (small cell) wireless communication facilities, the following offices review and comment, if required:
      i. MDOT SHA's OOC Utilities Division – Reviews and approves all plans and documentation for technical sufficiency and compliance with requirements.
      ii. MDOT SHA's Office of CHART & ITS Development - ITS Division – Reviews and approves all plans, equipment, and materials (fiber, electronics, etc.) for technical sufficiency and technical standards.
      iii. MDOT SHA's Office of Structures - Reviews all plans, and materials to determine if the proposed facilities would interfere with a structure's maintenance, inspection,

operations, structural integrity, or aesthetics. Any attachments to structures shall be reviewed and approved by Office of Structures. Refer to Section 9.05 - ATTACHMENTS TO HIGHWAY STRUCTURES for further guidance.

iv. MDOT SHA's Office of Environment - Reviews the Companies environmental commitments and documents for compliance.

v. MDOT SHA's Office of Traffic and Safety - Reviews all plans to determine any potential conflicts with existing traffic facilities. (signs, signals, etc.)

vi. MDOT SHA's District Office(s) – Maintenance Section to reviews all plans to determine any potential conflicts with existing maintenance facilities. (drainage structures, underdrains, lighting, etc.) Utilities Section to review for possible conflicts with what is proposed.

vii. MDOT SHA's Office of Materials – Reviews and approves all materials (steel, conduit, structures, etc.) for compliance to current technical standards.

c) For RS installations on MDOT SHA (non-right-of-way) property, the following offices review and comment, if required:

i. MDOT SHA's OOC Utilities Division – Reviews and approves all plans and documentation for technical sufficiency and compliance with requirements.

ii. MDOT SHA's Office of CHART & ITS Development - ITS Division – Reviews and approves all plans, equipment, and materials (fiber, electronics, etc.) for technical sufficiency and technical standards.

iii. MDOT SHA's Facilities Manager - Reviews all plans, and materials to determine if the proposed installations would interfere with maintenance, inspection, operations, structural integrity, or aesthetics the MDOT SHA's facility. Any attachments to any building shall be reviewed and approved by professional engineer registered in Maryland must show that the structure can safely withstand the additional stress.

iv. MDOT SHA's Office of Environment - Reviews the Companies environmental commitments and documents for compliance.

v. MDOT SHA's Office of Real Estate (ORE) – Review if the property has any title restrictions; or any other existing restrictions of its use or other information in ORE's files that would raise a potential concern

vi. MDOT SHA's District Office(s) – Maintenance Section to reviews all plans to determine any potential conflicts with existing maintenance facilities. (drainage structures, underdrains, lighting, etc.) Utilities Section to review for possible conflicts with what is proposed.

vii. MDOT SHA's Office of Materials – Reviews and approves all materials (steel, conduit, structures, etc.) for compliance to current technical standards.

3. The MDOT SHA RS Committee Lead will compile a summary of technical review comments received for the MDOT SHA RS Committee.

a) If the Technical Review from MDOT SHA's offices is unfavorable, the MDOT SHA RS Committee Lead will contact the Company regarding MDOT SHA's comments.

i. The Company may submit revised plans, or an alternate route/site along with any additional or revised documentation, if required, for review to the MDOT SHA RS Committee Lead.

ii. If the Company is unable or willing to submit revised plans, or an alternate route/site, the Company's RS proposal is rejected.

E) Public Outreach and Public Meetings

1. If the technical review is favorable, the MDOT SHA RS Committee will determine if a public outreach and/or public meetings are required based on the magnitude and scope of the Company's RS Proposal:

   a) For RS projects NOT requiring a public meeting - The MDOT SHA RS Committee Lead will compile and prepare a written summary of the comments for the MDOT SHA RS Committee.

   i. Continue to Section 6.15.05 (F) Agreement Preparation & Negotiation for further guidance.

   b) For RS projects requiring a public meeting - The MDOT SHA RS Committee Lead will inform the Company to set up and conduct a public meeting and outreach for the Company's proposed site.

2. When proposing construction at a site on MDOT SHA's right-of-way or other MDOT SHA owned property requiring public outreach and a public meeting, the Company shall conduct public outreach and any public meeting(s) for the Company's proposed RS project.

   a) Public Outreach

   i. The MDOT SHA's Office of Communications will provide the list of officials and local community groups to the Company for the proposed RS project public outreach.

   ii. The Company shall submit the draft letter to the MDOT SHA Office of Communication for review and approval prior to sending to the officials and local community groups.

   iii. The Company shall send letters to Officials and the local community groups notifying them of the proposed placement of the telecommunications facilities.

   b) Public Meetings

   i. The Company shall schedule, advertise, and chair any public meeting(s) to discuss local concerns and provide information on the proposed site.

   ii. The MDOT SHA RS Committee Lead or designated representative will attend the public meeting and provide a written summary of the meeting for the MDOT SHA RS Committee.

   iii. Representatives of the MDOT SHA RS Committee will attend the meeting when necessary.

   iv. The Company, the MDOT TSO RS Committee, & the MDOT SHA RS Committee will address and resolve any issues, if any, bought up at the public meeting or public outreach.

v. The public outreach and public meeting(s) may be performed concurrently with the MDOT SHA offices review and comment portion of the Technical Review when approved by the MDOT SHA RS Committee.

3. Deputy Administrator Approval of RS Projects Requiring Public Outreach & Public Meeting

a) The MDOT SHA RS Committee will summarize all of the reviews, reports, and comments in a report with recommendations if the RS project should be approved to continue or be denied for the MDOT SHA Deputy Administrator/Chief Engineer for Operations.

i. If the MDOT SHA Deputy Administrator/Chief Engineer for Operations approves the RS project, the Company's RS proposal can be sent to MDOT TSO's RS Committee with the RSA upon completion of the agreement.

- When required, the MDOT SHA RS Committee Lead will also prepare a letter from the MDOT SHA Deputy Administrator/Chief Engineer for Operations to the FHWA stating that the RS project is approved and requesting FHWA's concurrence.

ii. If the MDOT SHA Deputy Administrator/Chief Engineer for Operations denies the RS project, the Company's RS proposal is rejected

F) Agreement Preparation & Negotiation

1. The MDOT SHA RS Committee facilitates and negotiates agreements between the MDOT SHA and Private Sector entities.

a) Any agreement that is equal to, or greater than, one hundred thousand dollars ($100,000) in total contract value, resulting from negotiations with the Company, is subject to the LPC review and BPW approval.

b) The Agreement Preparation & Negotiation may be performed concurrently with the Initial and Technical Reviews.

2. The MDOT SHA RS Committee and the Company will meet to draft a mutually acceptable RSA by the Company, the MDOT SHA, and the MDOT TSO.

3. The review, revisions and meetings by the MDOT SHA RS Committee and the Company will continue until a final draft RSA is mutually acceptable by the Company, the MDOT SHA, and MDOT.

G) DoIT Review, LPC Approval, Agreement Finalization & BPW Approval

1. Upon approval of the final draft of the RSA by the Company, the MDOT SHA, and the MDOT, the MDOT SHA RS Committee forwards the Company's RS Proposal with a copy of the final RSA and the approved plans to the MDOT TSO RS Committee.

2. The MDOT TSO RS Committee reviews the Company's RS Proposal and the MDOT TSO Resource Share Administrator then forwards the Company's RS Proposal with a copy of the final RSA and the approved plans to DoIT for review and approval.

3. DoIT Review

a) If the DoIT's State Resource Sharing Manager DOES NOT approve the Company's RS Proposal:

i. DoIT's State Resource Sharing Manager will inform MDOT TSO RS Committee and the MDOT SHA RS Committee of revisions needed in the Company's RS Proposal for approval

ii. The MDOT SHA RS Committee Lead informs the Company of needed revisions in the RSA.

iii. The Company shall revise the draft RSA and then return the draft RSA to the MDOT SHA RS Committee.

iv. If the Company declines to revise its draft RSA, the RS Proposal is rejected.

v. The MDOT SHA RS Committee and, if necessary MDOT SHA's Assistant Attorney General will review the revised draft RSA from the Company; then forward to the MDOT TSO RS Committee.

vi. The MDOT SHA RS Committee and, if necessary MDOT SHA's Assistant Attorney General will review the revised draft RSA from the Company; then forward to DoIT's State Resource Sharing Manager.

b) If the DoIT's State Resource Sharing Manager does approve the Company's RS Proposal and determines the value of the RS Proposal equals or exceeds $100,000; and both DoIT and MDOT agree to proceed with the proposal; then the DoIT's State Resource Sharing Manager will proceed with the LPC Approval and possibly the E-Maryland Market Place advertisement.

4. LPC Approval

a) DoIT submits the Company's RS Proposal to the LPC for its review and comment. The LPC has up to 60 days to review and comment on the proposals.

b) Simultaneously with the LPC approval request, DoIT may advertise the Company's RS Proposal in the E-Maryland Market Place for a period of at least 30 days.

5. Agreement Finalization

a) Upon approval of the RSA by the LPC, DoIT's State Resource Sharing Manager forwards a copy for the LPC's approval to MDOT SHA RS Committee and the MDOT TSO RS Committee.

b) The MDOT SHA RS Committee Lead informs the Company of the LPC's approval and requests the Company to sign two (2) originals of the RSA; and then forward all originals to the MDOT SHA RS Committee.

c) The MDOT SHA RS Committee has the RSA signed by the MDOT SHA's Office of Communications and Office of Construction - Statewide Utilities Engineer for technical sufficiency; MDOT SHA's Office of the Attorney General for legal sufficiency; and the MDOT SHA Deputy Administrator/Chief Engineer for Operations for approval. All originals of the RSA are then forwarded to the MDOT TSO Resource Share Administrator.

d) The MDOT TSO Resource Share Administrator forwards the signed RSA's to DoIT for signature by Secretary of DoIT.

6. BPW Approval

a) DoIT's State Resource Sharing Manager prepares the Board of Public Works Agenda Item for the BPW approval of the RSA.

i. The Agenda Item shall contain the Company's Comptroller Number.

b) The Agenda Item goes to the BPW on DoIT's agenda.

i. This takes approximately 30 days to put an item on the agenda for the BPW.

c) The BPW meets to vote on the RSA.

i. It takes approximately 30 days from an item placed on the agenda to the BPW meeting.

d) If the BPW approves the RSA at the meeting, the BPW will sign the RSA and return all originals of the RSA to DoIT.

i. DoIT's State Resource Sharing Manager forwards the signed original copies of RSA to the MDOT TSO Resource Share Administrator.

ii. The MDOT TSO Resource Share Administrator retains a copy and forwards fully executed originals of the RSA to the Company and the MDOT SHA RS Committee for their records.

i. The MDOT TSO Resource Share Administrator updates the RSA database.

H) Construction and Maintenance

1. Upon receipt of the fully executed RSA, the Company shall submit the following to the MDOT SHA:

a) The Company's performance surety in accordance with Section 6.15.01 (F) Qualifications For Participating In Resource Sharing.

b) All other documentation, if not previously submitted, to become recognized as an Authorized Public Utility with the MDOT SHA in accordance with Section 3.02 - AUTHORIZED PUBLIC UTILITIES.

2. The Company may apply for the MDOT SHA's Utility Construction Permit from the appropriate MDOT SHA District Office(s) while waiting for the fully executed copy of the RSA in accordance with CHAPTER 3: PERMITS.

3. The Company shall perform the construction and restoration in accordance with MDOT SHA's Utility Construction Permit, CHAPTER 4: UTILITY CONSTRUCTION, and CHAPTER 5: ENVIRONMENTAL REVIEW AND CONSTRUCTION INSPECTION.

4. The Company shall apply for MDOT SHA's Utility Blanket Permit from the appropriate MDOT SHA District Office(s) for routine maintenance and emergency work in accordance with CHAPTER 3: PERMITS.

5. The Company shall perform only routine maintenance and emergency work in accordance with MDOT SHA's Utility Blanket Permit.

a) Any alterations, additions, modifications, improvements, or other construction shall require review by the MDOT SHA, a new Utility Construction Permit and, at MDOT SHA's sole determination, a revision to the Company's RSA.

6.15.06 Resource Sharing Process – Under $100k

A) Resource Sharing Proposal Submittal & DoIT Valuation

1. Generally, there are 2 means by which the MDOT SHA receives RS Proposals valued under One Hundred thousand Dollars ($100,000). They are:

a) The Company applies for a Utility Permit to install communication facilities which is determined to be RS by the MDOT SHA.

i. The MDOT SHA RS Committee Lead will inform the Company that they need to submit a RS Proposal for their proposed installations.

b) The Company submits a RS proposal to the State.

i. Proposals received directly by MDOT TSO or DoIT should be forwarded to MDOT SHA RS Committee.

2. Each proposal will be reviewed and considered by MDOT SHA's RS Committee.

a) The MDOT SHA RS Committee may request any additional technical, legal, or other assistance from any source that the Committee deems appropriate.

3. The MDOT SHA RS Committee will generally meet with the Company to discuss all technical and economic value aspects of their proposal in order to clearly understand the proposal.

b) This meeting can occur, but not necessarily required, either before or after the Company submits their proposal.

4. After the Company submits their RS Proposal, the MDOT SHA RS Committee will consider both the technical and economic value factors set forth in the proposal.

a) If the proposal is to install a facility on an MDOT SHA Public Safety Tower, the Company shall complete a Tower & Shelter Request Form for review and approval by the State Infrastructure Executive Committee (SIEC) – Technical Subcommittee.

i. The Company shall submit the form to MDOT SHA CHART, ITS Division - Chief for submittal to SIEC Technical Subcommittee for its review.

ii. The Tower & Shelter Request Form can be downloaded from the MDOT SHA's website at https://www.roads.maryland.gov/OOC_Forms/Request%20for%20Tower%20Shelter%20Space%20v053007.doc

c) Should the MDOT SHA RS Committee determine that it is in the State's best interest to proceed with the RS proposal; the MDOT SHA RS Committee will send the Company's RS Proposal to the MDOT TSO Resource Share Administrator.

5. Each proposal received will be reviewed and considered by MDOT TSO's RS Committee.

a) The MDOT TSO RS Committee is comprised of the following members:

- MDOT TSO Resource Share Administrator – Facilitates Committee meetings and negotiations between MDOT SHA and Private Sector entities relating to telecommunications
- MDOT TSO Assistant Attorney General – Reviews all agreements for legal sufficiency
- MDOT Enterprise/RSA Fiber Coordinator - Reviews all fiber optic proposals for MDOT/TBU needs; technical sufficiency; and technical standards
- MDOT TBU Representatives - Coordinates technical reviews/comments among within their respective TBU
- MDOT SHA Office of Construction (OOC) - Statewide Utilities Engineer – Coordinates technical reviews/comments among MDOT SHA Districts and Design Offices
- MDOT SHA Office of CHART & ITS Development- ITS Division Engineering & Technical Support – Reviews all proposals for technical sufficiency and technical standards
- MDOT SHA CHART, ITS Division - Chief – Reviews agreements pertaining to Intelligent Transportation Systems

b) The RS Committee may request any additional technical, legal, or other assistance from any source that the Committee deems appropriate.

c) The MDOT TSO Resource Share Administrator:

i. Requests MDOT TBU's, DoIT, DNR, etc. to review and comment on the Company's proposed RS project for current or potential future RS needs and/or opportunities; and

ii. Compiles any needs and/or requests and prepares a Needs & Requests Summary for the MDOT TSO RS Committee; and

iii. Updates the RSA database; and

iv. Forwards the proposal to DoIT's State Resource Sharing Manager for determination of the value and comments.

B) Initial Review

1. Upon receipt of the DoIT's State Resource Sharing Manager's determination of the value and comments, the MDOT TSO Resource Share Administrator will forward DoIT's information and the Needs & Requests Summary to the MDOT SHA RS Committee.

2. The MDOT SHA RS Committee Lead will request other MDOT SHA offices to review and comment on the Company's proposed RS project for current or potential future RS needs and/or opportunities. These offices may include, but not limited to:

- MDOT SHA Office of Preliminary Planning and Engineering Data Services Engineering Division,
- MDOT SHA Office of CHART & ITS Development
- MDOT SHA Office of Traffic & Safety

a) The MDOT SHA RS Committee Lead will compile any needs and/or requests and prepares a summary for the MDOT SHA RS Committee

b) The MDOT SHA RS Committee Lead is assigned by the MDOT SHA RS Committee based on the type of RS Proposal submitted by the Company.

3. Upon receipt of the DoIT's proposal valuation and comments, the MDOT SHA RS Committee Lead will begin the Initial Review and the Agreement Preparation & Negotiation.

a) The Initial, Field, and Technical Reviews may be performed concurrently with the Agreement Preparation & Negotiation.

4. The MDOT SHA RS Committee Lead requests other MDOT SHA offices to review and comment on the Company's RS proposed routes or sites:

a) Office of Real Estate (ORE) – review if the right-of-way or property is MDOT SHA's; any title restrictions; review if the right-of-way or property was purchased as a scenic enhancement/landscape parcel; or any other existing restrictions of its use or other information in ORE's files that would raise a potential concern.

b) Office of Preliminary Planning and Engineering (OPPE) – review for possible conflicts with future highway or bridge projects.

c) Office of Highway Development (OHD) – review for possible conflicts with current and/or future highway projects.

d) Office of Structures (OOS) – review for possible conflicts with current and/or future bridge projects.

e) MDOT SHA's District Office(s) – review for possible conflicts with what is proposed; and potential interference with district maintenance operations and/or maintenance contracts.

5. The MDOT SHA RS Committee Lead will compile a summary of comments received for the MDOT SHA RS Committee.

a) If the initial review from MDOT SHA's offices is unfavorable, the MDOT SHA RS Committee Lead will contact the Company regarding MDOT SHA's comments.

i. The Company may submit revised plans, or an alternate route/site for review to the MDOT SHA RS Committee Lead.

ii. If the Company is unable or willing to submit revised plans, or an alternate route/site, the Company's RS proposal is rejected.

C) Field Review

1. If the initial review is favorable, the MDOT SHA RS Committee will determine if a field review is required based on the magnitude and scope of the Company's RS Proposal.

a) If the MDOT SHA RS Committee determines that a field review is NOT required, then the MDOT SHA RS Committee Lead will determine if a Technical Review will be required of the Company's RS Proposal.

i. Continue to Section 6.15.06 (D) Technical Review for further guidance.

b) If the MDOT SHA RS Committee determines that a field review is required, the MDOT SHA RS Committee Lead will set up and conduct a field review of the Company's proposed route or site.

2. The Field Review consists of MDOT SHA's OOC Utilities representative(s), the District Utility Engineer from the appropriate district(s), MDOT SHA's Office of CHART & ITS Development - ITS Division representative(s), and Company representative(s).
   - **a)** MDOT TSO's Resource Sharing Administrator, MDOT TSO's OTTS Fiber Coordinator, Federal Highway representative(s) and/or others may be invited to the meeting if necessary.
   - **b)** Proposed routes or sites within the Interstate/NHS highway system right-of-way may require FHWA comments and/or concurrence.
3. At the field review, the criteria for placement of the proposed utility facilities shall be evaluated as per the MDOT SHA's Utility Manual, Chapter 6, Utility Accommodation, Subsection 6.15 – RESOURCE SHARING. Additional criteria may be considered depending on the type of facilities proposed and on-site conditions.
   - **a)** Potential macro wireless communication site locations will be reviewed for ease of tower erection, site access, power and telecom availability, construction constraints, neighboring buildings and environmental impact.
   - **b)** Potential new fiber installation routes will be reviewed for constructability/constraints, compliance to MDOT SHA's Utility Manual, and environmental impact. Alternate routes may be suggested or recommended.
4. The MDOT SHA RS Committee Lead will request all who were in attendance at the field meeting to prepare written comments for the MDOT SHA RS Committee.
   - **a)** The MDOT SHA RS Committee Lead will compile and prepare a written summary of the comments for the MDOT SHA RS Committee.
5. The MDOT SHA RS Committee reviews the summaries of the initial review and the field meeting from the MDOT SHA RS Committee Lead.
   - **a)** If the field meeting is unfavorable, the MDOT SHA RS Committee Lead will contact the Company regarding MDOT SHA's comments.
     - **i.** The Company may submit revised plans, or an alternate route/site for review to the MDOT SHA RS Committee Lead.
     - **ii.** If the Company is unable or willing to submit revised plans, or an alternate route/site, the Company's RS proposal is rejected.

D) Technical Review

1. If the Initial Review is favorable; and the Field Review is either favorable or not required; the MDOT SHA RS Committee will determine if a Technical Review is required based on the magnitude and scope of the Company's RS Proposal.
   - **a)** If the MDOT SHA RS Committee determines that a Technical Review is NOT required, then the MDOT SHA RS Committee Lead will determine if public outreach and/or public meetings will be required of the Company's RS Proposal.
     - **i.** Continue to Section 6.15.06 (E) Public Outreach and Public Meetings for further guidance.
   - **b)** If the MDOT SHA RS Committee determines that a Technical Review is required, the MDOT SHA RS Committee Lead will begin the Technical Review.

2. The MDOT SHA RS Committee Lead will request fully engineered technical plans from the Company for the Technical Review.
3. Upon receipt of the fully engineered technical plans from the Company, the MDOT SHA RS Committee Lead will forward copies of the fully engineered technical plans from the Company to various MDOT SHA offices for review and comment depending on the type of facility (Fiber installation or wireless telecommunication).
   - **a)** For new fiber optic installations or use of existing MDOT fiber infrastructure, the following offices review and comment, if required:
     - **i.** MDOT SHA's OOC Utilities Division – Reviews and approves all plans and documentation for technical sufficiency and compliance with requirements.
     - **ii.** MDOT SHA's Office of CHART & ITS Development - ITS Division – Reviews and approves all plans, equipment, and materials (fiber, electronics, etc.) for technical sufficiency and technical standards.
     - **iii.** MDOT SHA's Office of Structures - Reviews all plans, and materials to determine if the proposed facilities would interfere with a structures maintenance, inspection, operations, structural integrity, or aesthetics. Any attachments to structures shall be reviewed and approved by Office of Structures. Refer to Section 9.05 - ATTACHMENTS TO HIGHWAY STRUCTURES for further guidance.
     - **iv.** MDOT SHA's Office of Environment - Reviews the Companies environmental commitments and documents for compliance.
     - **v.** MDOT SHA's Office of Traffic and Safety - Reviews all plans to determine any potential conflicts with existing traffic facilities. (signs, signals, etc.)
     - **vi.** MDOT SHA's District Office(s) – Maintenance Section to reviews all plans to determine any potential conflicts with existing maintenance facilities. (drainage structures, underdrains, lighting, etc.) Utilities Section to review for possible conflicts with what is proposed.
     - **vii.** MDOT TSO's Enterprise/RSA Fiber Coordinator – Reviews and approves all plans, equipment, and materials (fiber, electronics, etc.) for technical sufficiency and technical standards.
   - **b)** For macro (cell towers) or micro (small cell) wireless communication facilities, the following offices review and comment, if required:
     - **i.** MDOT SHA's OOC Utilities Division – Reviews and approves all plans and documentation for technical sufficiency and compliance with requirements.
     - **ii.** MDOT SHA's Office of CHART & ITS Development - ITS Division – Reviews and approves all plans, equipment, and materials (fiber, electronics, etc.) for technical sufficiency and technical standards.
     - **iii.** MDOT SHA's Office of Structures - Reviews all plans, and materials to determine if the proposed facilities would interfere with a structure's maintenance, inspection, operations, structural integrity, or aesthetics. Any attachments to structures shall be reviewed and approved by Office of Structures. Refer to Section 9.05 - ATTACHMENTS TO HIGHWAY STRUCTURES for further guidance.
     - **iv.** MDOT SHA's Office of Environment - Reviews the Companies environmental commitments and documents for compliance.

v. MDOT SHA's Office of Traffic and Safety - Reviews all plans to determine any potential conflicts with existing traffic facilities. (signs, signals, etc.)

vi. MDOT SHA's District Office(s) – Maintenance Section to reviews all plans to determine any potential conflicts with existing maintenance facilities. (drainage structures, underdrains, lighting, etc.) Utilities Section to review for possible conflicts with what is proposed.

vii. MDOT SHA's Office of Materials – Reviews and approves all materials (steel, conduit, structures, etc.) for compliance to current technical standards.

c) For RS installations on MDOT SHA (non-right-of-way) property, the following offices review and comment, if required:

i. MDOT SHA's OOC Utilities Division – Reviews and approves all plans and documentation for technical sufficiency and compliance with requirements.

ii. MDOT SHA's Office of CHART & ITS Development - ITS Division – Reviews and approves all plans, equipment, and materials (fiber, electronics, etc.) for technical sufficiency and technical standards.

iii. MDOT SHA's Facilities Manager - Reviews all plans, and materials to determine if the proposed installations would interfere with maintenance, inspection, operations, structural integrity, or aesthetics the MDOT SHA's facility. Any attachments to any building shall be reviewed and approved by professional engineer registered in Maryland must show that the structure can safely withstand the additional stress.

iv. MDOT SHA's Office of Environment - Reviews the Companies environmental commitments and documents for compliance.

v. MDOT SHA's Office of Real Estate (ORE) – Review if the property has any title restrictions; or any other existing restrictions of its use or other information in ORE's files that would raise a potential concern

vi. MDOT SHA's District Office(s) – Maintenance Section to reviews all plans to determine any potential conflicts with existing maintenance facilities. (drainage structures, underdrains, lighting, etc.) Utilities Section to review for possible conflicts with what is proposed.

vii. MDOT SHA's Office of Materials – Reviews and approves all materials (steel, conduit, structures, etc.) for compliance to current technical standards.

4. The MDOT SHA RS Committee Lead will compile a summary of technical review comments received for the MDOT SHA RS Committee.

a) If the technical review from MDOT SHA's offices is unfavorable, the MDOT SHA RS Committee Lead will contact the Company regarding MDOT SHA's comments.

i. The Company may submit revised plans, or an alternate route/site along with any additional or revised documentation, if required, for review to the MDOT SHA RS Committee Lead.

ii. If the Company is unable or willing to submit revised plans, or an alternate route/site, the Company's RS proposal is rejected.

E) Public Outreach and Public Meetings

1. If the Initial Review is favorable; and the Field & Technical Reviews are either favorable and/or not required; the MDOT SHA RS Committee will determine if public outreach and/or public meetings are required based on the magnitude and scope of the Company's RS Proposal:

   a) For RS projects NOT requiring a public meeting - The MDOT SHA RS Committee Lead will compile and prepare a written summary of the comments for the MDOT SHA RS Committee.

      i. Continue to Section 6.15.06 (F) Agreement Preparation & Negotiation for further guidance.

   b) For RS projects requiring a public meeting - The MDOT SHA RS Committee Lead will inform the Company to set up and conduct a public meeting and outreach for the Company's proposed site.

2. When proposing construction at a site on MDOT SHA's right-of-way or other MDOT SHA owned property requiring public outreach and a public meeting, the Company shall conduct public outreach and any public meeting(s) for the Company's proposed RS project.

   a. Public Outreach

      i. The MDOT SHA's Office of Communications will provide the list of officials and local community groups to the Company for the proposed RS project public outreach.

      ii. The Company shall submit the draft letter to the MDOT SHA Office of Communication for review and approval prior to sending to the officials and local community groups.

      iii. The Company shall send letters to Officials and the local community groups notifying them of the proposed placement of the telecommunications facilities.

   b. Public Meetings

      i. The Company shall schedule, advertise, and chair any public meeting(s) to discuss local concerns and provide information on the proposed site.

      ii. The MDOT SHA RS Committee Lead or designated representative will attend the public meeting provide a written summary of the meeting for the MDOT SHA RS Committee.

      iii. Representatives of the MDOT SHA RS Committee will attend the meeting when necessary.

      iv. The Company, the MDOT TSO RS Committee, & the MDOT SHA RS Committee will address and resolve any issues, if any, bought up at the public meeting or public outreach.

      v. The public outreach and public meeting(s) may be performed concurrently with the MDOT SHA offices review and comment portion of the Technical Review.

3. Deputy Administrator Approval of RS Projects Requiring Public Outreach & Public Meeting

a) The MDOT SHA RS Committee will summarize all of the reviews, reports, and comments in a report with recommendations if the RS project should be approved to continue or be denied for the MDOT SHA Deputy Administrator/Chief Engineer for Operations.

i. If the MDOT SHA Deputy Administrator/Chief Engineer for Operations approves the RS project, the Company's RS proposal can be sent to MDOT TSO's RS Committee with the RSA upon completion of the agreement.

- If required, the MDOT SHA RS Committee Lead will also prepare a letter from the MDOT SHA Deputy Administrator/Chief Engineer for Operations to the FHWA stating that the RS project is approved and requesting FHWA's concurrence.

ii. If the MDOT SHA Deputy Administrator/Chief Engineer for Operations denies the RS project, the Company's RS proposal is rejected

F) Agreement Preparation & Negotiation

1. The MDOT SHA RS Committee facilitates and negotiates agreements between the MDOT SHA and Private Sector entities.

a) Any agreement that is equal to, or greater than, one hundred thousand dollars ($100,000), resulting from negotiations with the Company, is subject to the BPW approval.

b) The Agreement Preparation & Negotiation may be performed concurrently with the Initial and Technical Reviews.

2. The MDOT SHA RS Committee and the Company will meet to negotiate draft terms for a mutually acceptable RSA by the Company, the MDOT SHA, and the MDOT TSO. Items that may be discussed and negotiated can include, but not limited to, are:

a) The Company's proposal and the current or potential future RS needs and/or opportunities from MDOT SHA's offices and/or the MDOT TSO RS Committee

b) The fair and reasonable compensation which can be in the form of monetary, in-kind, or a combination of both monetary and in-kind compensation.

c) Any other term or condition of the proposed draft RSA except for those terms' mandatory by Maryland State statute.

3. The MDOT SHA RS Committee will assemble and prepare a draft RSA from RSA templates with the draft terms agreed to from the meeting with the Company.

a) The draft RSA will be reviewed and revised, if necessary, by MDOT, MDOT's Assistant Attorney General, the MDOT SHA and MDOT SHA's Assistant Attorney General.

4. The MDOT SHA RS Committee will then forward the draft RSA to the Company for their review and comment with its terms and conditions.

5. The Company shall review the draft RSA and revise, if necessary, then return the draft RSA to the MDOT SHA RS Committee.

a) The Company may request a meeting with the MDOT SHA RS Committee to discuss the MDOT SHA RS Committee's revisions.

6. The MDOT SHA RS Committee will review the draft RSA from the Company.

a) The draft RSA will be revised, if necessary, by the MDOT, MDOT's Assistant Attorney General, the MDOT SHA and MDOT SHA's Assistant Attorney General and returned to the Company.

b) The MDOT SHA RS Committee may request a meeting with the Company to discuss the Company's revisions.

7. The review, revisions and meetings by the MDOT SHA RS Committee and the Company will continue until a final draft RSA is mutually acceptable by the Company, the MDOT SHA, and MDOT.

G) DoIT Review & Agreement Finalization

1. Upon approval of the final draft of the RSA by the Company, the MDOT SHA, and the MDOT, the MDOT SHA RS Committee forwards the Company's RS Proposal with a copy of the final RSA and the approved plans to the MDOT TSO RS Committee.

2. The MDOT TSO RS Committee then forwards the Company's RS Proposal with the recommendation letter from MDOT's Secretary to DoIT's Secretary for review and approval.

3. DoIT Review

a) If the DoIT's State Resource Sharing Manager DOES NOT approves the Company's RS Proposal:

i. DoIT's State Resource Sharing Manager will inform MDOT TSO RS Committee and the MDOT SHA RS Committee of revisions needed in the Company's RS Proposal for approval

ii. The MDOT SHA RS Committee Lead informs the Company of needed revisions in the RSA.

iii. The Company shall revise the draft RSA and then return the draft RSA to the MDOT SHA RS Committee.

iv. If the Company declines to revise its draft RSA, the RS Proposal is rejected.

v. The MDOT SHA RS Committee and, if necessary MDOT SHA's Assistant Attorney General will review the revised draft RSA from the Company; then forward to the MDOT TSO RS Committee.

vi. The MDOT SHA RS Committee and, if necessary MDOT SHA's Assistant Attorney General will review the revised draft RSA from the Company; then forward to DoIT's State Resource Sharing Manager.

b) If the DoIT's State Resource Sharing Manager approves the Company's RS Proposal and determines the value of the RS Proposal equals or exceeds $100,000; and both DoIT and MDOT agree to proceed with the proposal; then there will be 2 processes that may be performed concurrently. The processes are the LPC Approval and the Agreement Finalization.

4. **Agreement Finalization**

   a) Upon approval of the RSA by the DoIT State Resource Sharing Manager, the MDOT SHA RS Committee Lead informs the Company of DoIT's approval and requests the Company to sign two (2) originals of the RSA; and then forward all originals to the MDOT SHA RS Committee.

   b) The MDOT SHA RS Committee has the RSA signed by the MDOT SHA's Office of Communications and Office of Construction - Statewide Utilities Engineer for technical sufficiency; MDOT SHA's Office of the Attorney General for legal sufficiency; and the MDOT SHA Deputy Administrator/Chief Engineer for Operations for approval.

      i. One original is returned to the Company; one original is retained by the MDOT SHA RS Committee; and a copy of the RSA will be sent to the MDOT TSO Resource Share Administrator.

   c) The MDOT TSO Resource Share Administrator updates the RSA database.

5. **LPC & BPW Approvals**

   a) RSA's under One Hundred Thousand Dollars ($100,000) do not require LPC approval or the BPW to approve and sign.

H) Construction and Maintenance

1. Upon receipt of a fully executed RSA, the Company shall, if it has not already done so, submit the following:

   a) The Company's performance surety in accordance with Section 6.15.01 (F) Qualifications For Participating In Resource Sharing.

   b) All other documentation, if not previously submitted, to become recognized as an Authorized Public Utility with the MDOT SHA in accordance with Section 3.02 - AUTHORIZED PUBLIC UTILITIES.

2. The Company may apply for the MDOT SHA's Utility Construction Permit from the appropriate MDOT SHA District Office(s) while waiting for the fully executed copy of the RSA in accordance with CHAPTER 3: PERMITS.

3. The Company shall perform the construction and restoration in accordance with MDOT SHA's Utility Construction Permit, CHAPTER 4: UTILITY CONSTRUCTION, and CHAPTER 5: ENVIRONMENTAL REVIEW AND CONSTRUCTION INSPECTION.

4. The Company shall apply for MDOT SHA's Utility Blanket Permit from the appropriate MDOT SHA District Office(s) for routine maintenance and emergency work in accordance with CHAPTER 3: PERMITS.

5. The Company shall perform only routine maintenance and emergency work in accordance with MDOT SHA's Utility Blanket Permit.

   a) Any alterations, additions, modifications, improvements, or other construction shall require review by the MDOT SHA, a new Utility Construction Permit and, at MDOT SHA's sole determination, a revision to the Company's RSA.

6.16 EMERGING TECHNOLOGIES

A) Technological advancements have shaped the utility industry, with new technologies constantly occurring and making their way into the mainstream. The use of mobile phones and Internet commerce are examples of emerging technologies that are now widespread. These innovations provide enormous benefits, but their success cannot take place in a vacuum. Ensuring that emerging capabilities are implemented in a safe, consistent, and efficient manner within transportation right-of-way is an important part of the MDOT SHA's mission to ensure a fast, safe, efficient, accessible, and convenient transportation system.

B) Frequently the MDOT SHA receives proposals for the accommodation, installation, operation, and maintenance of those emerging technologies which represent progressive developments in technical innovations. As such there is a need to assess emerging technologies to determine what, if any benefit and/or impact there is to the transportation system.

C) Refer to FHWA's Quick Guide: Requirements for Renewable Energy Projects in Highway Right-of-Way for more information.

D) The MDOT SHA currently uses RSA's for telecommunications/IT, the MDOT SHA may use RSA's and a similar review process as in Section 6.15 - RESOURCE SHARING for placing Emerging Technologies such as Distributed Antenna Systems on MDOT rights-of-way or other MDOT SHA property.

6.16.01 Distributed Antenna Systems

A) Distributed Antenna System (DAS), also known as micro-cell or mini-cell facilities, is a network of spatially separated antenna nodes connected to a common source via a transport medium that provides wireless service within a geographic area or structure. DAS antenna elevations are generally at or below the clutter level, and node installations are compact.

B) The Company shall be an Authorized Public Utility in order to obtain permits.

1. Refer to Section 3.02 - AUTHORIZED PUBLIC UTILITIES for additional guidance.

C) As DAS typically implies telecommunication, the MDOT SHA may consider DAS within MDOT SHA's rights-of-way (fully controlled access, partially controlled access, and non-controlled access) and other MDOT SHA real estate as RS as determined by the MDOT.

1. Any proposed RS for DAS shall follow Section 6.15 RESOURCE SHARING as applicable.

2. Compensation to the MDOT SHA may be monetary, in-kind, or other services, subject to negotiation.

3. Any RSA's for DAS shall be in accordance with Section 6.15.04 Resource Sharing Agreements as applicable.

D) If the Company proposes to install any telecommunications facilities within MDOT SHA rights-of-way, or other MDOT SHA property, the Company shall be required to enter into a RS agreement with the MDOT SHA.

1. Refer to Section 6.15 – RESOURCE SHARING for additional guidance.

E) Installing new poles along a highway can materially affect the safe operation of traffic, future modifications, and the efficiency of maintenance. Utilities are expected to consolidate their facilities when performing relocation work or installing new utilities in order to preserve as much of the corridor as possible for the transportation function. Therefore, the MDOT SHA has adopted a general position of discouraging the installation of new poles along a highway except

where there is no other feasible and reasonable place to locate the DAS facilities. Where it is feasible and reasonable to locate the DAS facilities elsewhere, new pole installations along a highway will not be permitted.

1. Refer to Section 6.13 – CONSOLIDATION AND JOINT USE for additional guidance.
2. There may be a circumstance where the Company determines a new pole may be needed. The Company shall submit an exception request to the appropriate district for review.
   a) The exception request must be **reasonable** and within the parameters of normal industry standards. There must be a **valid** reason for the exception, and it should not place the convenience of the utility ahead of the requirements of the MDOT SHA. Issues or circumstances cited as reasons for the exception must be **verified** by documentation. The proposed exception must also be **justified** as the only viable means of installing the proposed DAS facilities based on all other alternatives considered but rejected.
   b) Refer to Section 2.07 - EXCEPTIONS for additional guidance.
3. If the district concurs that a new pole is warranted, a full review is required to ensure that MDOT SHA requirements are met.
   a) Many sections of this Utility Manual require approvals from other MDOT SHA offices (OOS, OOTS, HDD, etc.) prior to the MDOT SHA approving certain utility work within MDOT SHA rights-of-way. This is MDOT SHA's process to ensure thorough reviews by the appropriate offices.
   b) Refer to Section 2.01 - DESIGN for additional guidance.
4. In the event that the proposed new pole is a steel pole or greater than 75 feet, the same design and review requirements shall be followed as a monopole cell tower.
   a) Refer to Section 6.15.02.C.3 - New Macro Wireless Telecommunication Tower/Monopole Requirements for additional guidance.
5. The MDOT may deny any new pole installations if the MDOT determines the new installation would create a burden on the state such as safety hazard, detrimental environmental impact, etc.

F) DAS facilities are strictly prohibited from being attached to any bridge or other structure.

1. Refer to CHAPTER 9: BRIDGES AND OTHER STRUCTURES for additional guidance.

G) Traffic signals are for public safety; therefore, DAS facilities are strictly prohibited on any traffic signal structure.

H) DAS facilities are not permitted on any traffic structure without a complete review and specific written approval from the Office of Traffic and Safety.

1. Refer to CHAPTER 10: SIGNALS, SIGNS, AND OTHER TRAFFIC STRUCTURES for additional guidance.
2. Traffic structures are considered state assets, therefore, if the Office of Traffic and Safety approves DAS facilities on a traffic structure, the Company shall be required to enter into a RSA with the MDOT SHA.
   a) Refer to Section 6.15 - Resource Sharing for additional guidance.

6.16.02 Solar Photovoltaic Facilities

A) Solar PV facilities shall be designed so as not to impede the safety and security of the MDOT SHA transportation infrastructure. The Solar PV facility shall not interfere with the existing use of the MDOT SHA right-of-way or other MDOT SHA property or preclude any future use of the MDOT SHA right-of-way or other MDOT SHA property as determined by MDOT SHA.

1. Solar PV facilities shall be designed to avoid or minimize potential impacts to future highway improvements; to avoid interference with highway maintenance and operations; and to permit access to the utility lines or renewable energy infrastructure for the Company's maintenance with minimum interference to highway traffic.

2. In all cases, consideration must be given to measures necessary to preserve and protect the safety, operation, integrity and visual quality of the highway, and its maintenance efficiency. Prior to approving any project, the Company shall demonstrate that the real property or right of way is suitable to accommodate any proposed facilities without adverse effect on the highway's design, construction, future utility or stormwater expansions on projects, or safety characteristics.

3. Solar PV facilities shall not obstruct the required motorist sight distances.

4. Solar PV facilities shall be designed to be as unobtrusive as possible.

B) Solar PV facilities must be designed and built of durable material for a long service life with minimal routine service and maintenance. All structure designs and equipment must be planned to minimize hazards and interference with highway traffic when additional overhead and underground lines or energy generation or transmission infrastructure are installed at a future date. Installation of new hardware requires strict adherence to the temporary traffic control plans and the allowable lane closures schedule as approved in the individual site plans.

C) The Company shall be solely responsible for obtaining all required permits and approvals before commencing any construction, installation, reconstruction, maintenance, repair, operation, or removal work and for making all necessary submissions to appropriate environmental regulatory agencies.

D) All proposed Solar PV facilities located on MDOT SHA right-of-way or other MDOT SHA property shall comply at all times with all applicable Federal, state, and local laws, rules, regulations, ordinances, statutes and decisions.

1. The Company shall perform a regulatory assessment and provide documentation to the MDOT SHA that the proposed Solar PV facility is in compliance with said laws, rules, regulations, ordinances, statutes, and decisions.

E) Any proposed solar PV systems shall be in accordance with Chapter 2 – DESIGN and Chapter 6 – ACCOMODATION as applicable.

F) In addition to compliance with Chapter 2 – DESIGN and Chapter 6 – ACCOMODATION, the Company shall provide the following detailed Solar PV System design information to the MDOT SHA:

1. Photovoltaic equipment selection (type of PV panels)
2. Mounting structures (fixed tilt and single axis tracking)
3. Other conceptual design elements and specifications (panels, racks, inverters, etc.)
4. Documentation from the local distribution utility and/or the PSC (as applicable) that the solar power generated from DC to AC power can be exported to the utility grid.
5. Documentation from the local distribution utility that the available line loading capacity of the distribution line can safely handle the additional power from the proposed solar PV system.

CHAPTER 7

UTILITY RELOCATION

7.01 GENERAL

A) The concept presented in this CHAPTER 7 - RELOCATION is that of making the utility "whole." In many cases that means a utility's service should be functionally restored so that it may continue to provide its product to its users in a fashion similar to that which existed prior to its relocation as a result of the highway project.

B) The premise of making the utility "whole" is not limited necessarily to the functionality of the facilities. In many cases, the premise of making the utility "whole" may also mean that certain properties may have to be “restored” to that which existed prior to construction of the highway project as well.

C) The issue of the equivalency of a functional replacement arises frequently. Although each situation has to be evaluated on its own merits, "capacity" is one common measure that can be used in determining the equivalency of the replacement facility. Obviously, the specific unit of measure of capacity will vary depending on the commodity to be conveyed or the facility involved. This may range from a volume unit of measurement on a pipeline to a kilovolt unit for an electrical line.

D) Generally, replacement facilities that maintain the overall functional capacity, even including those that may rearrange this capacity to a more efficient operation as a result of present day design or operation needs are eligible for reimbursement.

E) Additionally, it is recognized that in replacing certain functions, some changes may be required to meet present standards. For instance, if a waterline is replaced, under the present fire codes the new waterline may require certain features, such as additional fire hydrants, which were not part of the old facility. Features required to meet present standards are considered to be an essential part of the functional replacement and are eligible for reimbursement.

7.02 GUIDANCE DOCUMENTS for UTILITY RELOCATION

A) All utility relocation shall be in complete conformance with specifications, standards, provisions and policies of Section 1.08 - GENERAL GUIDANCE DOCUMENTS.

B) In addition to the documents referenced in the previous paragraph, all utility relocations shall be in complete conformance with, and particular attention to, the specifications, standards, provisions and policies of the following agencies, organizations, institutes and publications as applicable to the type of utility facility and/or type of work:

- FHWA Program Guide (FAPG): Utility Relocation and Accommodation On Federal-Aid Projects
- A Policy on the Accommodation of Utilities Within Freeway Right-of-Way
- A Guide for Accommodating Utilities Within Highway Right-of-Way
- Generally Accepted Accounting Principles (GAAP)
- Federal Acquisition Regulations (FAR)
- Book of Standards For Highway & Incidental Structures
- National Electric Code (NEC)
- National Electric Safety Code (NESC)
- Standard Specifications For Construction And Materials
- Supplemental Specifications and Provisions
- MDOT SHA's Accessibility Guidelines for Pedestrian Facilities along State Highways

- MDOT SHA Utility Manual
- MDOT SHA Utility Procedures Manual

Whenever MDOT SHA's Standard Specifications For Construction And Materials is referred to in this Chapter or this Utility Manual, the latest version of the Supplemental Specifications and Provisions shall be reviewed to ensure the most current specification is used.

7.03 COST RESPONSIBILITY

A) The United States Code (23 USC 123) provides in part that "Federal funds shall not be used to reimburse the State under this section when the payment to the utility violates the law of the State or violates a legal contract between the Utility and the State."; and that utility relocation costs are eligible for federal reimbursement to the extent that the State is obligated to pay for such work. In addition, any betterment to the utility is not eligible.

B) The common law in Maryland is that where utilities are located permissibly in the public right-of-way, the utilities are responsible for the cost of relocation where such relocation is required by public necessity/public project.

C) The Utility is not responsible for those relocation costs only if:

1. The Utility has a documented property right; or

2. There is a statutory provision or MDOT SHA policy that shifts the cost responsibility to the MDOT SHA; or

3. An agreement with the utility that expressly requires the MDOT SHA to pay the relocation costs.

D) The following items are required by the MDOT SHA, for each Utility impacted by an MDOT SHA project, in order to adequately and accurately determine each Utility's Cost Responsibility for that project:

1. Prior Rights Report
a) See Section 7.03.01 (C) for additional information.

2. Utility Relocation Plans
a) See Section 2.02 PLANS and 7.07.02.01 - Utility Relocation PS&E Plans for additional information.

3. Utility Cost Estimate
a) See 7.07.02.03 - Utility Cost Estimates for additional information.

4. Utility Agreement
a) See Section 2.03 AGREEMENTS and 7.07.02.04 - Utility Agreements for additional information.

7.03.01 Property Interests

A) Historically, it has been Federal policy to "make the utility whole again," and to limit utility participation only to the value derived from their prior investment. Likewise, Maryland has followed FHWA's policy to "make the utility whole" to the extent that existed prior to MDOT SHA's construction.

B) Prior Rights is an industry term and refers to the superiority (order) of property interests determined between multiple parties. The MDOT SHA and the Utility's jointly use a process whereby the property interests in the land over which or in which the utility facility is located

are determined. If the Utility owns the land or has real property interest in it, the Utility is said to have prior rights. If the land is outside of the MDOT SHA right-of-way, and neither the MDOT SHA or the Utility has an easement or other real property interest in the land, the Utility is said to have prior rights for that specific MDOT SHA project. The party without prior rights is responsible for all of the non-betterment costs related to that segment of utility relocation.

C) For MDOT SHA projects, a Prior Rights Report is developed by the MDOT SHA, in conjunction with the Utilities, to determine the property interests of the MDOT SHA and each of the Utilities.

1. The District Utilities Section or an MDOT SHA consultant initiates completion of the Facility Description/Pole Number, Offset, and Station portion of the UTILITY TABULATION (RW-57) FORM; the District Utilities Section will send the RW-57 Form, with this information, to the Utility Company.

a) In the event that the Utility Company initiates completion of the RW-57 Form, the Utility Company shall review the Utility Company's property records and then complete the Date of Grant to Utility; Utility Title Acquired From; and Title Reference; in addition to the Facility Description/Pole Number, Offset, and Station information portion of the RW-57 Form; and then send the RW-57 Form to the appropriate District Utilities Section.

2. The Utility Company shall verify Facility Description/Pole Number, Offset, and Station information is correct; review the Utility Company's property records; and then complete the Date of Grant to Utility; Utility Title Acquired From; and Title Reference portion of the RW-57 Form; then returns the RW-57 Form with their property interest information to the appropriate District Utilities Section.

a) In the event that the Utility Company initiates completion of the RW-57 Form, the appropriate District Utilities Section will verify the Facility Description/Pole Number, Offset, and Station information portion of the RW-57 Form.

3. The District Utilities Section forwards the RW-57 Form, along with a marked-up set of plans showing the location of the utilities facilities, to the Office of Real Estate – Records & Research Division.

4. The ORE - Records & Research Division review the MDOT SHA's right-of-way plats; and then complete the Location, MDOT SHA Responsibility, and Remarks portion of the RW-57 Form and prepares the Prior Rights Report.

a) The Prior Rights Report consists of a written report and includes the completed Utility Tabulation (RW-57) Form(s).

b) Information on obtaining copies of the MDOT SHA's right-of-wat plats can be found on the MDOT SHA website at https://www.roads.maryland.gov/mdotsha/pages/index.aspx?PageId=304

5. ORE - Records & Research sends copies of the Prior Rights Report to the appropriate District Utilities Section, the Utility Company, OOC – Utilities Section, etc.

6. Refer to the UTILITY TABULATION (RW-57) FORM in the APPENDIX for additional information.

D) To avoid complicated bookkeeping, most Utilities have elected to use the methodology whereby certain indicators are used in determining cost responsibility.

1. Commonly used indicators are lengths of underground cable, conduit, or pipe.
2. Frequently, separate prior rights percentages must be assigned for each indicator (e.g. pole, pipe, or cable size) to improve the equity of the cost responsibility determination.
3. Only existing utility facilities which are impacted (removed) by the proposed highway improvements or incur significant work (adjusted / relocated) to accommodate the relocated utility system are counted.
   - **a)** Utility Relocation Plans are required in order to determine which utility facilities are impacted.
4. For aerial systems, the indicators chosen are poles.
   - **a)** All poles which have significant work to be performed on them (adjusted, relocated or facilities removed) due to MDOT SHA construction or safety work are assigned their proper prior rights status.
   - **b)** Service connections and poles used solely for guying are incidental to the project and are not assigned separate indicators.
   - **c)** Existing poles which are worked on only (wire or facilities added) to accommodate the relocated utility system do not indicate cost responsibility and are not to be counted.
   - **d)** A factor is calculated by dividing the number of poles determined to be the Utility's responsibility by the total number of poles involved.
   - **e)** This factor, converted to a percentage is applied to the non-betterment cost of the utility work to determine the Utility cost responsibility.
5. To be consistent in the application of the indicator methodology, all cost responsibility indicators within one MDOT SHA construction contract must be treated as one project with only one cost responsibility percentage for each type of material selected as an indicator.
   - **a)** Utility work cannot be grouped according to location, time, or personnel factors with a separate prior rights percentage for each group.
   - **b)** The Utility may release the project as small sub-projects, but the final bill must be adjusted to reflect the overall prior rights percentage after the final utility work is completed.
     - **i.** At the MDOT SHA's sole discretion, the MDOT SHA may consider an alternative procedure for allowing a project billing to be separated into sub-billings provided circumstances warrant consideration.

E) Utilities which have documented property interest(s) will continue to have these rights on future projects.

7.03.02 Public Utility Easements (PUE's)

A) PUE's are generally not utility specific. Therefore, unless the Utility has an easement granted specifically to that Utility Company, which can be considered a recorded property right, the Utility shall not be eligible to retain any future compensable rights.

B) The MDOT SHA may cover the initial relocation (one-time only) on a case-by-case basis.

C) Refer to Section 2.04 (D) - Public Utility Easements for additional information.

7.03.03 Facilities That Serve a Transportation Purpose

The MDOT SHA may participate in the cost to install, adjust, or relocate facilities such as lighting, water, sewer, power, gas, and telecommunications which serve a transportation purpose such as highway lighting or to serve an MDOT SHA facility, rest or recreational area where the ownership of such facilities is to remain with a Utility when it is found to be in the public interest.

7.04 BETTERMENTS

A) MDOT SHA's cost participation is based on the cost of providing the most economical replacement facility or restoration of functionally equivalent service to the facility being replaced. It is considered a betterment if a utility's service is functionally restored such that it provides its product to its users in a fashion superior or exceeds that which existed prior to its relocation as a result of the highway project. Betterment incorporated into utility work will fall into one of the following categories:

1. **Elective Betterments:** are those constructed at the election of the utility and are not attributable to the transportation project. (i.e. increased service capacity or service improvements)
   - **a)** The costs of elective betterment items are NOT eligible for MDOT SHA and Federal participation.
   - **b)** A credit for Elective Betterments shall be required and shown on the estimate and the final bill.
   - **c)** Minor Elective Betterments should be depicted on the plan as part of the work proposed.
   - **d)** Major Elective Betterments shall require the Utility to submit a Replacement-In-Kind Utility Relocation PS&E and the Actual Utility Relocation PS&E to the MDOT SHA for review.
     - **i.** Refer to Section 7.04.02 – Replacement-In-Kind for additional information.
2. **Forced Betterments:** are also known as non-elective betterments; those necessitated by the transportation project construction. (i.e. eliminate/avoid a conflict with a highway feature or proposed improvement.)
   - **a)** The costs of forced betterment items are eligible for MDOT SHA and Federal participation.
   - **b)** Minor Forced Betterments should be depicted on the plan as part of the work proposed.
   - **c)** Major Forced Betterments shall require the Utility to submit a Replacement-In-Kind Utility Relocation PS&E and the Actual Utility Relocation PS&E to the MDOT SHA for review.
     - **i.** Refer to Section 7.04.02 – Replacement-In-Kind for additional information.

B) The utility shall identify all betterment costs as a separate line item, either as Elective Betterment or Forced Betterment, on the estimate when the Utility provides its PS&E to the MDOT SHA.

1. Refer to Section 7.07.02.03 (D) (9) Betterments for additional guidance.

C) The utility shall identify all betterment costs as a separate line item, either as Elective Betterment or Forced Betterment, on the Summary of Billing (Form UC-12) when the Utility provides its Final Bill to the MDOT SHA.

1. Refer to Section 7.08.02.01 (A) (3) Betterment Costs for additional guidance.

7.04.01 Spare Ducts

A) General

1. The MDOT SHA recognizes that certain utility companies lose system capacity in some cases when the MDOT SHA forces the Utility to relocate underground.

2. When a Utility is forced to go underground with an aerial system because of MDOT SHA's improvements (i.e. widening a roadway at a utility crossing), one spare conduit will be allowed to be charged to the project to facilitate replacing a failed cable.

a) Electric facilities will be allowed one spare duct only if the existing facility is at full capacity.

3. Any additional conduits installed will be at the expense of the Utility including installation costs.

4. Reimbursement for ducts will be paid for on the basis of the required duct footage/divided by the total installed duct footage times the total cost of the ducts.

5. When an existing underground duct line is relocated, and the utility has prior rights, the SHA will pay for the full cost of manholes on the relocated duct line even though additional spare ducts may be installed.

6. MDOT SHA requirements remain unchanged in cases where the Utility elects to relocate aerial facilities underground at their own choice. The MDOT SHA shall require a replacement-in-kind PS&E for the relocation of the aerial facility and an actual PS&E.

B) Electric Facilities

1. The following criteria shall be used for determining the number of electric ducts required when an electric utility is forced to relocate aerial facilities underground because of MDOT SHA's improvements:

- 35 ft. Facilities – 2 Ducts
- 40 ft. Facilities – 3 Ducts
- 45 ft. Facilities – 4 Ducts
- 50 ft. Facilities – 5 Ducts
- 55 ft. Facilities – 6 Ducts

2. In-line poles that are a majority of one particular size will determine the height of the facility and conduit requirements.

3. Poles of varying heights for grade changes shall not be used in determining height of existing facilities.

4. One spare duct will be allowed if the existing facility is at full capacity.

C) Communication / Joint Use / Other Facilities

1. Other facilities such as communications, CATV, interconnect, etc. are capable of using inner duct to accommodate facilities within a duct.

2. Therefore, the number of ducts required when a communication, joint use or other utility facilities are forced to relocate aerial facilities to an underground system because of MDOT SHA's improvements shall be based on the capacity of duct(s) using inner duct for the existing facilities only.

7.04.02 Replacement-In-Kind

A) Replacement-In-Kind refers to a utility system, when replaced as a result of an MDOT SHA project, is replaced with a system that is functionally similar to that which existed prior to construction. An aerial utility system is replaced with an aerial system. An underground utility system is replaced with an underground system; and so forth.

B) However, in those situations when the existing utility system is relocated/replaced with or converted to a different type of system, the MDOT SHA shall require the Utility to submit 2 different types of Utility Relocation PS&E's for review in order to determine betterment and cost responsibility. They are:

1. **Replacement-In-Kind Utility Relocation PS&E:** which reflects the relocations of the existing utility system with a similar type of system based on the conflicts with highway features: AND an,

2. **Actual Utility Relocation PS&E:** which reflects the actual relocation of the existing utility system to the new (actual) type of utility system.

C) Consistent with existing statutes and policies; and the necessity or desire for relocating existing aerial lines to an underground system within certain areas, the following methods of sharing cost responsibility shall pertain under various circumstances:

1. Where an aerial utility line exists, and aerial relocation is not possible due to project constraints, or the MDOT SHA desires the existing aerial utility line to be underground, the MDOT SHA will consider this a FORCED BETTERMENT.

a) The MDOT SHA will be responsible for the cost of the difference between the Replacement-In-Kind Utility Relocation PS&E and the Actual Utility Relocation PS&E plus MDOT SHA's portion of its cost responsibility of the Replacement-In-Kind Utility Relocation PS&E.

b) The Utility shall be responsible for the Utility's portion of its cost responsibility of the Replacement-In-Kind Utility Relocation PS&E.

c) Refer to Section 7.04 (A) 2. Forced Betterments for additional information.

2. Where an aerial utility line exists and aerial relocation is possible and the Utility desires the existing aerial utility line to be underground, the MDOT SHA will consider this an ELECTIVE BETTERMENT.

a) The Utility shall be responsible for the cost of the difference between the Replacement-In-Kind Utility Relocation PS&E and the Actual Utility Relocation PS&E plus the Utility's portion of its cost responsibility of the Replacement-In-Kind Utility Relocation PS&E.

b) The MDOT SHA will be responsible for MDOT SHA's portion of its cost responsibility of the Replacement-In-Kind Utility Relocation PS&E.

c) Refer to Section 7.04 (A) 1. Elective Betterments for additional information.

3. Where an aerial utility line exists; relocation of the aerial facilities is possible; and a third party (ex. Municipality or local government) desires the existing aerial utility line to be placed underground, the MDOT SHA will consider this an ELECTIVE BETTERMENT.
   - **a)** The third party shall be responsible for the cost of the difference between the Replacement-In-Kind Utility Relocation PS&E and the Actual Utility Relocation PS&E plus the Utility's portion of its cost responsibility of the Replacement-In-Kind Utility Relocation PS&E.
   - **b)** The MDOT SHA will be responsible for MDOT SHA's portion of its cost responsibility of the Replacement-In-Kind Utility Relocation PS&E.
   - **c)** The Utility shall be responsible for the Utility's portion of its cost responsibility of the Replacement-In-Kind Utility Relocation PS&E.
   - **d)** Refer to Section 7.04 (A) 1. Elective Betterments for additional information.

D) The MDOT SHA may require, at its sole discretion, a Replacement-In-Kind Utility Relocation PS&E and the Actual Utility Relocation PS&E for any project the MDOT SHA determines additional detail is necessary to accurately determine betterments.

7.05 STATUTORY PROVISIONS AFFECTING COST RESPONSIBILITY

There are existing statutory provisions in the Transportation Article of the Annotated Code of Maryland requiring the MDOT SHA to pay for certain utility relocations under certain circumstances. They are:

7.05.01 Road Transfers

1. The MDOT SHA will pay for the initial relocation (one-time only) when a county road changes to a state road, less any betterments.
   - **a)** Refer to § 8-304 of the Transportation Article for more information.
   - **b)** However, unless the Utility has received an easement or other legal instrument giving the Utility a documented property right from the county prior to the road transfer to the state, the Utility shall not continue to retain these rights on future MDOT SHA projects.

7.05.02 Interstate highways

1. The MDOT SHA will pay for the publicly owned utilities when constructing, reconstructing, or improving an interstate highway, less any betterments.
   - **a)** Refer to § 8-506 of the Transportation Article for more information.
   - **b)** Refer to Table 3 of FHWA Route Log and Finder List of the Interstate Highway System to identify the interstate routes in Maryland which would qualify under this article.

7.05.03 Railroad Related Crossings

1. The MDOT SHA will pay for the utility relocations for railroad grade crossings and railroad grade separation projects, less any betterments.
   - **a)** Refer to § 8-641 of the Transportation Article for more information.

b) However, for MDOT SHA projects that are not specific railroad grade crossing projects or railroad grade separation projects (ex. An MDOT SHA highway project that has a railroad crossing within the limits of construction of the project), the utility cost determination will be based on the prior rights of the project.

i. In accordance with § 8-641 of the Transportation Article, the utility shall have the prior rights for the portion of the facilities within the railroad right-of-way.

7.06 MDOT SHA POLICIES AFFECTING COST RESPONSIBILITY

The MDOT SHA has certain long-standing policies where the MDOT SHA has elected to pay for certain utility relocations. They are:

A) High Voltage Line Act

B) Rework

C) Cancelled Projects

7.06.01 High Voltage Line Act (HVLA)

A) Title 6 of the LABOR AND EMPLOYMENT Article of Maryland's Annotated Code (HVLA) states in part, *"If any part of an individual or object will come within 10 feet of a high voltage line while performing the activity, a person shall comply with § 6-107 of this title before the person may perform, or require or allow an employee to perform, any… activities…"*

1. Refer to Section 6.12 HIGH VOLTAGE LINE ACT and Section 4.03 SAFETY for additional information.

B) MDOT SHA's practice is (in the interest of safety) to reimburse 100% of the relocation, only for the electric companies, when electric facilities are temporarily relocated under the HVLA.

C) The requirements to qualify for reimbursement under the HVLA are as follows:

1. Applies to only aerial electric lines (transmission or distribution); AND

2. The relocations are temporary; AND

3. The poles must be able to be returned to the EXACT location as prior to construction; AND

4. The ELECTRIC LINES must be able to be returned to the EXACT (both horizontal and vertical) location as prior to construction.

D) Other Situations that can qualify for reimbursement under the HVLA are:

1. Outages of the electric lines; or

2. Temporary protection of the electric lines

7.06.02 Rework

A) REWORK is a situation where the Utility has relocated (or started to relocate) its facilities and has to move the relocated facilities a second time on the same project as a result of a project or design change by the MDOT SHA.

B) MDOT SHA's practice (in keeping with "making the utilities whole") is to reimburse 100% of the relocation for only the facilities that were relocated a second time on the same project as a result of MDOT SHA's project or design change.

C) Rework for a project under construction shall not affect the prior rights and cost responsibility in connection with future projects at the same location.

D) All other work on the same project that was not relocated a second time as a result of MDOT SHA's project or design change is reimbursed based on the Prior Rights Percentage established for the project.

E) Temporary work required as a result of project phasing or maintenance of traffic requirements DOES NOT qualify as REWORK.

1. Refer to Section 7.06.02.01 - Temporary Utility Work for additional guidance.

F) Project scope changes that extend the project and merely add work IS NOT REWORK. It is additional work and is reimbursed based on Prior Rights.

G) When submitting the Final Bill Package for the project, the Utility needs to submit documentation showing, IN DETAIL, the rework separate from the relocation work reimbursed which is based on Prior Rights. Supporting documentation for the rework will include:

1. Plans

2. Summary of Billing (Form UC-12) for the rework

3. Material & Payroll supporting documentation

7.06.02.01 Temporary Utility Work

A) The cost of temporary work will be included in the utility project cost and will be subject to the same prior rights percentage as the permanent work.

1. In a case where a Utility has no prior rights and is required to move multiple times because of MDOT SHA staged construction, the Utility is responsible for all of the utility relocation costs.

2. Where the Utility has prior rights, the MDOT SHA will reimburse the Utility for all temporary work made necessary by MDOT SHA construction.

3. Regardless of cost responsibility the MDOT SHA will cooperate with the Utility to minimize the costs of the Utility moves and the MDOT SHA construction.

B) If a utility has relocated in connection with a particular project and due to a change in plans for that same project an additional relocation is required, the MDOT SHA will be financially responsible for the second relocation caused by the change to the plans.

1. Refer to Section 7.06.02 - Rework for additional guidance.

C) This will not affect the prior rights and cost responsibility in connection with future projects at the same location.

7.06.03 Cancelled Projects

A) During the course of the development of a project, situations arise which require the MDOT SHA to indefinitely suspend the design of a project or completely remove a project from MDOT SHA's project development schedule. These are referred to as Cancelled Projects.

B) MDOT SHA's practice (in keeping with "making the utilities whole") is to reimburse 100% of the design costs incurred by the Utility up to the point the project was cancelled by the MDOT SHA.

C) In the event that the MDOT SHA resurrects the project, the design costs paid by the MDOT SHA are added to the other work; and is then reimbursed based on the Prior Rights Percentage established for the project.

D) When submitting the Invoice for the project, the Utility needs to submit documentation showing, IN DETAIL, the expenses incurred by the Utility up to the date the project was cancelled by the MDOT SHA. Supporting documentation for the Cancelled Project shall include:

1. Cover Letter requesting for reimbursement of expenses
2. Invoice
3. Summary of Billing (Form UC-12) (for the expenses incurred)
4. Material & Payroll supporting documentation

7.07 UTILITY COMPANY PERFORMED RELOCATIONS

A) Typically, on MDOT SHA projects, the Utility will perform the design and relocation of its facilities either with its own forces or with consultants and/or contractors the Utility has procured. When the Utility is performing its own design and/or relocations with its own forces or with its consultants and/or contractors, the Utility shall submit to the MDOT SHA, a Utility Relocation Plan, Specification, and Estimate (Utility Relocation PS&E) package for the highway and bridge construction project that is sufficiently informative and complete to provide the MDOT SHA with:

- a clear description of the relocations/work to be performed
- the sequence of work activities required
- any contract or construction needs
- a detailed estimate

B) On large projects where federal funds will be used for reimbursement, the Utility may be required to submit a Utility Preliminary Engineering (PE) Package (for design) in addition to a Relocation Utility Plans, Specifications, & Estimate (PS&E) Package (for construction).

1. Both the Utility PE Package and the Utility Relocation PS&E Package need **prior** approval before the Utility can start work.
2. Not all projects will require submittal of a separate Utility PE Package in addition to the Utility Relocation PS&E Package.
3. The District Utility Engineer will inform the Utility which projects will require the submittal of the Utility PE Package.

7.07.01 Utility Preliminary Engineering Package

On large projects where the Utility is required to submit a Utility Preliminary Engineering (PE) Package in addition to a Utility Relocation PS&E Package, the Utility PE Package shall include the following:

A) Utility Cost Estimate

The Utility Cost Estimate for a Utility PE Package will contain, if applicable, Salaries & Wages, Overhead Costs, Supplies, Equipment & Transportation Costs, and Consultant Costs.

1. Refer to Section 7.07.02.03 - Utility Cost Estimates for additional guidance.
2. Refer to MDOT SHA's Utility Cost Estimate (Form UC-4) for additional information.

B) Utility Agreement

The Utility Agreement for the Utility PE Package is for the design activities and preparation of the Utility Relocation PS&E Package. While any of the forms of agreements are acceptable, it is recommended that a simple agreement such as the Contract Assignment (Form UC-5 PE) or Letter Exchange Agreement be used for the Utility PE Package and then incorporated or amended into the more comprehensive or formal agreement used for the Utility Relocation PS&E Package submittal if necessary.

1. Refer to Section 2.03 AGREEMENTS and Section 7.07.02.04 - Utility Relocation Agreements for additional guidance.

7.07.02 Utility Relocation Plans, Specifications & Estimate Package

A) Utility Relocation Plans, Specifications, & Estimate (PS&E) Packages shall be submitted to the District Utility Engineer for review and transmittal to Office of Construction - Utilities.

B) Utility Relocation PS&E Packages shall be considered incomplete until enough information is received to allow for a meaningful review.

1. Generalized, vague, or incomplete information will delay the review process and could potentially result in a delay of the Utility's relocations and a delay claim from MDOT SHA's contractor.

C) The Utility Relocation PS&E Packages shall include the following:

1. Utility Relocation PS&E Plans

a) Refer to Section 2.02 PLANS and Section 7.07.02.01 - Utility Relocation PS&E Plans for additional guidance.

2. Utility Relocation Specifications

a) Refer to Section 7.07.02.02 – Utility Relocation Specifications for additional guidance.

3. Utility Relocation Cost Estimate

a) Refer to Section 7.07.02.03 - Utility Relocation Cost Estimates for additional guidance.

4. Utility Relocation Agreement

a) Refer to Section 2.03 AGREEMENTS and Section 7.07.02.04 - Utility Relocation Agreements for additional guidance.

7.07.02.01 Utility Relocation PS&E Plans

A) The Utility shall submit Utility Relocation PS&E Plans which shall show the details of the utility's relocations that are necessary to clear a project sufficiently for MDOT SHA's contractor to construct a specific project. The Utility Relocation PS&E Plans should be tailored to provide all information necessary for the MDOT SHA to verify that all the utility conflicts have been addressed for resolution.

B) Refer to Section 2.02.06.03 - Utility Relocation PS&E Plans for additional guidance.

C) Refer to Section 8.05.04.04 (A) - General for additional guidance.

7.07.02.02 Utility Relocation Specifications

A) The Utility shall provide sufficient information for the MDOT SHA to prepare: the Special Provisions, Section 875 - Utility Statement, incorporated into MDOT SHA's IFB Proposal; and MDOT SHA's Utility Certification Statement (Form UC-6).

B) Refer to Section 7.10.01 - Utility Statement for additional guidance.

C) Refer to Section 8.05.05.03 - Utility Final Review Coordination Meeting for additional guidance.

D) Refer to MDOT SHA's Utility Certification Statement (Form UC-6) for additional information.

7.07.02.03 Utility Relocation Cost Estimate

A) The Utility shall submit MDOT SHA's Utility Relocation Cost Estimate (Form UC-4) for the proposed work broken down by the estimated costs for each category of work.

1. Refer to 23 CFR 645.117 and MDOT SHA's Utility Relocation Cost Estimate (Form UC-4) for additional information.

B) The estimate shall provide sufficient detail to provide the MDOT SHA with a reasonable basis for analysis.

C) The actual direct and indirect costs shall be accumulated in accordance with:

1. an established procedure developed by the utility which the utility uses in its regular operations; and with

2. Generally Accepted Accounting Principles (GAAP); and with

3. the Federal Acquisition Regulations (FAR).

D) The Utility Cost Estimate shall include the following items:

1. Labor Costs (Salaries & Wages)

Labor is the salaries & wages of the individuals who are directly related to utility relocation work and/or other activities necessitated by the construction of the project.

2. Overhead Costs

a) Under 23 USC 123, the term "cost of relocation" is defined as the entire amount paid by a utility that is properly attributable to the relocation. Overhead costs which can be shown by the records of the Utility to be reasonably associated with the project and in accord with Generally Accepted Accounting Principles (GAAP), and its standard accounting procedures and practice for assigning overhead expenses to other similar work which the utility undertakes.

b) Except for costs specifically allowed or disallowed by FHWA regulations, the cost principles found in the Federal Acquisition Regulations (FAR) are the primary criteria for determining the eligibility of overhead costs claimed by a Utility Company.

3. Materials (Supplies)

Materials shall be itemized where they represent relatively major components or cost in the relocation. Unit costs, such as broad-gauge units of property, may be used for estimating purposes where the utility uses such units in its own operations.

4. Equipment & Transportation Costs

Accounts for transportation and heavy equipment are used for accumulating expenses and distributing them to accounts properly chargeable with the services. Among the items of expense clearing through these accounts are:

- depreciation;
- fuel and lubricants for vehicles (including sales and excise taxes);
- freight and express on fuel and repair parts;
- heat, light, and power for garages and garage offices;
- insurance (including public liability and property damage insurance) on garages, transportation, and heavy work equipment;
- license fees for vehicles and drivers;
- maintenance of transportation and garage equipment;
- operation of garages; and
- rent of garage buildings and grounds.

5. Consultant Costs

Consultants may be obtained by the utility to provide preliminary engineering services for utility relocations. The consultant selection process shall, to the extent practicable, follow the procedures in 23 CFR 172, Administration of Engineering and Design Related Service Contracts.

6. Contractual

a) Where the Utility subcontracts its relocation work for major material procurements and major service procurements, the following documentation shall be required from the Utility:

- A copy of the current list of bidders for work of the types to be performed. An explanation of how this list was developed and maintained.
- A copy of each request for bids sent to companies on the list.
- A copy of each bid response received. (Minimum = 3 for each major procurement area.)
- A statement explaining why each winning bid was selected.

b) Where Utilities operate with existing continuing contracts for the major procurements, and the costs are periodically audited and considered reasonable by the MDOT SHA, some or all the document copies can be eliminated.

c) The document copies are not required if the utility work has been included as part of the MDOT SHA construction contract.

7. Removal Costs & Salvage Costs

a) Costs for the removal of existing utility facilities are eligible for reimbursement provided the removal is necessitated by the highway project.

b) In some cases, it may be feasible to deactivate existing utility facilities and allow them to remain in place, particularly in urban areas when all the customers along a utility's line are to be removed as the result of a highway construction project, and in areas where the existing utility facilities will not conflict with the proposed highway project.

c) In cases where removing the existing utility facilities is not required, but where the utility or highway contractor still elects to proceed with the removal, any removal costs above the salvage value of recovered materials credited to the project are not eligible for reimbursement.

i. Refer to Section 7.07.03 - Salvage for additional guidance.

8. Construction Engineering

When not billed at actual, average, or other similar rates, engineering or inspection charges may be reimbursed under the utility's construction overhead account. These may include individuals who are engaged in the direct and immediate supervision of the work at the site of the project and in the actual preparation of the plans and estimate of the relocation/adjustment.

9. Betterments

a) Minor Betterments

On projects with minor betterment situations such as the utility proposes to install different devices or materials than are currently in place, or where an increased capacity can be determined easily (mathematically), the utility shall identify the betterment costs as a separate line item, either as Elective Betterment or Forced Betterment, on the estimate when the Utility provides its Relocation PS&E to the MDOT SHA.

b) Major or Extensive Betterments

On projects with major betterment situations, such as an aerial system is replaced with an underground system the MDOT SHA may require, at its sole discretion, a Replacement-In-Kind Utility Relocation PS&E and the Actual Utility Relocation PS&E in order to accurately determine betterments.

7.07.02.04 Utility Relocation Agreements

A) 23 CFR 645.113 states in part, *"On Federal-aid and direct Federal projects involving utility relocations, the utility and the TD shall agree in writing on their separate responsibilities for financing and accomplishing the relocation work."* As such, the MDOT SHA is required to have agreements with utilities in order to reimburse Utility Companies for utility relocations on highway projects.

B) Many Utilities have Utility Master Agreements with the MDOT SHA. Utilities that have Utility Master Agreements with the MDOT SHA shall submit a Contract Assignment Form (UC-5) as the agreement in the Utility Relocation PS&E.

1. Refer to Section 2.03.02 Contract Assignment Forms (UC-5) for further guidance.

C) Utilities that DO NOT have Utility Master Agreements with the MDOT SHA shall submit a written agreement to the MDOT SHA which identifies the Utility's and the MDOT SHA's responsibilities for financing and accomplishing the relocation work.

1. No special form of written agreement is prescribed.

2. Refer to Section 2.03 AGREEMENTS for further guidance.

7.07.03 Salvage

A) The proceeds of the sale of any materials recovered from a utility's temporary or permanent facility are to be credited to the cost of the project. In no event, would the State or the utility be considered an acceptable bidder for such materials.

B) Materials recovered from a utility's temporary or permanent facility that are accepted for return to the utility's stock are to be credited to the project at the current stock prices for such used materials.

1. If a utility charges recovered materials to the material and supply account at the original cost, or at a percent of the current new price, and if the utility follows a consistent practice in this regard, the work order may be credited accordingly.

7.07.04 Buy America Requirements

A) This Section Buy America Requirements applies to all utilities, privately or publicly owned, including local governments and municipalities.

B) All utilities, whether privately or publicly owned, shall comply with the federal or state Buy America Requirements, as determined by the MDOT SHA based on federal or state funding respectfully, when performing any utility related activity for an MDOT SHA's construction project.

C) Federal Law and Requirements

1. 23 U.S.C. 313 - Buy America

a) 23 U.S.C. 313 - Buy America states in part: *"Notwithstanding any other provision of law, the Secretary of Transportation shall not obligate any funds authorized to be appropriated to carry out the Surface Transportation Assistance Act of 1982 (96 Stat. 2097) or this title and administered by the Department of Transportation,* ***unless steel, iron, and manufactured products used in such project are produced in the United States.*** *"* And; *"Application to Highway Programs.* ***--The requirements under this section shall apply to all contracts*** *eligible for assistance under this chapter for a project carried out within the scope of the applicable finding, determination, or decision under the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), regardless of the funding source of such contracts, if at least 1 contract for the project is funded with amounts made available to carry out this title."*

b) Refer to 23 U.S.C. 313 - Buy America and FHWA's Buy America Q and A for Federal-aid Program for additional guidance.

2. The Intermodal Surface Transportation Efficiency Act (ISTEA)

a) Sections 1041(a) and 1048(a) of the ISTEA amended and clarified the Buy America provisions of Section 165(a) of the Surface Transportation Assistance Act of 1982 (STAA) and 23 CFR 635.410. Iron has been added to the materials now subject to the Buy America requirements, and the action of applying a coating (not the coating material) to the steel and/or iron is now deemed a manufacturing process subject to Buy America. Coating includes epoxy coating, galvanizing, painting, and any other coating that protects or enhances the value of a material subject to requirements of Buy America. Buy America requirements of 23 CFR 635.410 are applicable to all Federal-aid highway construction projects (NHS and non-NHS). This also applies to non-federal aid construction projects if federal aid funds were used for other phases.

b) Refer to ISTEA of 1991 and 23 CFR 635.410 for additional guidance.

D) Maryland Law – Buy America Requirements

The provisions of COMAR 21.11.02 pertain to implementation of Buy America requirements on Maryland projects.

E) The Utility may comply with the Buy America requirements by **one** of the following:

1. Material Certification

a) The Utility shall obtain documentation (material certifications) from the manufacturer of the iron and/or steel that the iron and/or steel meets Buy America Requirements.

i. Certification is required prior to permanent incorporation of iron and steel products into a Federal-aid project.

2. Minimal Use

a) The Utility shall provide documentation that the use of foreign steel is less than 0.1% contract value or $2500, whichever is greater.

3. Alternative Bid - Foreign vs Domestic Steel

a) The Utility shall provide copies of bids for foreign vs domestic steel.

i. Foreign steel alternative must be 25% lower than domestic alternative based on total contract bid.

4. Project Specific Waivers:

a) Waivers require approval from the U.S. Secretary of Department of Transportation.

b) The Federal Highway Administration (FHWA) will not accept waiver requests directly from the Utility.

c) Requests for waivers must be submitted in writing to the MDOT SHA and accompanied by supporting information.

i. Requests for waivers shall follow the same process as Utility Manual Exceptions Request Submittal Process. Refer to Section 2.07.01(G) Utility Manual Exception Request Process for additional guidance.

d) The Utility's request must comply with 23 CFR 635.410(c)(1)

i. The application of the Buy America provisions would be inconsistent with the public interest; or

ii. Steel and iron materials/products are not produced in the United States in sufficient and reasonably available quantities which are of a satisfactory quality.

e) The FHWA requires sufficient time for proper review and action on the request which can take several months.

7.08 UTILITY BILLING

7.08.01 Progress Billing

A) Progress billings are incrementally prepared invoices at different stages during the progress of a project based on the amount of work that has been completed to date. 23 CFR 645.117 (i) (1) states in part: "*the utility may be reimbursed through the State Transportation Department by progress billings for costs incurred.*"

B) In the past, the MDOT SHA has not required Utilities to submit progress billing for relocation reimbursements. However, as of the date of this Utility Manual, the Utility shall submit progress billings for MDOT SHA projects.

7.08.01.01 General

The Utility shall submit progress billings for reimbursement as follows:

A) For ANY project where the Utility's final bill will exceed 10% of the Utility Relocation PS&E Estimate regardless of the amount of the Utility Relocation PS&E Estimate.

1. The Utility shall submit a Progress Bill Package when the Utility incurs costs equal to 75% of the Utility Relocation PS&E Estimate.
2. In addition, the Utility shall attach a letter describing the percentage of the actual work completed, when the Utility expects the relocation work to be totally complete, the expected (new) cost of the utility relocations, and the reason for the increased costs (and time if applicable).
3. Refer to Section 7.08.01.02 - Utility Progress Bill Package for additional guidance.

B) For projects where Utility Relocation PS&E Estimate is less than $25,000.00.

1. The Utility is not required to submit a Progress Bill Package unless the Utility's final bill will exceed 10% of the Utility Relocation PS&E Estimate.
2. If the Utility's final bill will exceed 10% of the Utility Relocation PS&E Estimate, the Utility shall submit a Progress Bill Package as per Section 7.08.01.01 (A) - ANY PROJECT above.
3. Refer to Section 7.08.01.01 (A) - ANY PROJECT for additional guidance.

C) For projects where Utility Relocation PS&E Estimate is more than $25,000.00 but less than $100,000.00; the Utility shall submit a minimum of at least one Progress Bill Package when the Utility incurs costs equal to 75% of the Utility Relocation PS&E Estimate.

1. Refer to Section 7.08.01.02 - Utility Progress Bill Package for additional guidance.

D) For projects where Utility Relocation PS&E Estimate is more than $100,000.00, the Utility shall submit a minimum of at least one Progress Bill Package at each of the following stages: when the Utility incurs costs; (i) equal to 25% of the Utility Relocation PS&E Estimate; (ii) equal to 50% of the Utility Relocation PS&E Estimate, and (iii) equal to 75% of the Utility Relocation PS&E Estimate.

1. Refer to Section 7.08.01.02 - Utility Progress Bill Package for additional guidance.

7.08.01.02 Utility Progress Bill Package

A) The Utility Progress Bill shall include the following information:

1. MDOT SHA project number;
2. MDOT SHA project description;
3. The sequence number of the Utility Progress Bill;
4. Dates for the billing period covered;
5. The original Utility Relocation PS&E Estimate amount and any approved changes to that amount.

B) The Utility shall provide the following supporting documentation with the Utility Progress Bill Package:

1. A copy of the labor hours for the billing period covered.

2. A list of the major items/materials used such as poles, main wire, and ducts.

3. Billing detail for any sub-contractor billing included in the progress bill.

4. An estimate of the percentage of work completed during the billing period.

5. The prior-rights percentage used in the progress billing.

7.08.02 Final Bills

7.08.02.01 General

A) The Utility's Summary of Billing (Form UC-12) shall follow as closely as possible the order of the items in the Utility Relocation PS&E Cost Estimate (Form UC-4). In all cases, the Summary of Billing (Form UC-12) shall be provided in a format that allows comparisons to be made with the approved Utility Relocation PS&E Package.

1. The supporting documentation should be itemized to show the totals for labor, materials, overhead construction costs, travel expenses, transportation, equipment, handling costs, and other services.

a) Refer to MDOT SHA's Summary of Billing (Form UC-12) for additional information.

2. The Utility's Summary of Billing (Form UC-12) shall provide salvage credits from recovered and replaced permanent materials and recovered temporary materials as identified in the approved Utility Relocation PS&E Package.

a) Refer to Section 7.07.03 - Salvage for further guidance.

3. The Utility's Summary of Billing (Form UC-12) shall show any credits for Betterments identified in the approved Utility Relocation PS&E Package.

a) If the Utility Relocation PS&E Package included a Replacement-In-Kind PS&E and an Actual Utility Relocation PS&E, the Betterment shall be the percentage of the difference of the Replacement-In-Kind Utility Relocation PS&E and the Actual Utility Relocation PS&E divided by the Actual Utility Relocation PS&E.

i. Refer to Section 7.04 - BETTERMENTS for further guidance.

ii. Refer to Section 7.04.02 - Replacement-In-Kind for further guidance.

B) The Utility shall submit the Utility Final Bill Package within one year following completion of the utility relocation work.

1. CFR 645.117 (i) (2) states in part: "*The utility shall provide one final and complete billing of all costs incurred, or of the agreed-to lump-sum, within one year following completion of the utility relocation work, otherwise previous payments to the utility may be considered final, except as agreed to between the State Transportation Department and the utility.*"

2. If final billings are not received within this one-year period, the MDOT SHA may:

a) Consider previous payments made to the Utility to be final, or

b) Allow the Utility to submit the Utility Final Bill Package beyond this one-year period provided that the MDOT SHA and Utility have agreed in advance that a longer time period is needed to alleviate undue hardships.

i. The Utility must contact the MDOT SHA, in writing within this one-year period, and request that a longer time period is needed.

ii. The Utility must state in the letter how much additional time is needed and why the additional time is needed.

C) The Utility shall provide the location where the records and accounts billed can be audited.

1. CFR 645.117 (i) (3) states in part: "*All utility cost records and accounts relating to the project are subject to audit by representatives of the State and Federal Government for a period of 3 years from the date final payment has been received by the utility.*

7.08.02.02 Utility Final Bill Package

A) The Utility shall submit a Utility Final Bill Package which shall include the following items:

1. Two original copies of the Final Bill Invoice;

2. A fully completed Summary Of Billing (Form UC-12);

3. Two sets of As-Built Plans & One electronic copy of the As-Built Plans;

a) Refer to Section 2.02 PLANS and Section 2.02.06.05 Utility As-Built Plans for additional guidance.

4. A letter of explanation for any changes which affect the Final Bill.

a) This is required if the Final Bill exceeds 10% (over or under) the Utility Relocation PS&E Estimate.

B) The Utility Final Bill shall include the following information:

1. MDOT SHA project number;

2. MDOT SHA project description;

3. The original Utility Relocation PS&E Estimate amount and any approved changes to that amount.

4. The relocation cost amount showing all the Utility Progress Bill payments subtracted;

5. The amount of the Utility Final Bill.

C) The Utility shall provide the following supporting documentation with the Utility Final Bill Package:

1. A copy of the labor hours for the project.

2. A list of the major items/materials used such as poles, main wire, and ducts.

3. Billing detail for any sub-contractor billing.

4. Any other documentation needed to support the Utility Final Bill.

5. The location where the records and accounts billed can be audited.

7.09 UTILITY 3RD PARTY WORK

A) Utility relocation work that is incorporated into an MDOT SHA construction project is referred to as Utility 3rd Party Work. When utility relocation work is included in an MDOT SHA construction project, the coordination required for the utility relocations and project construction is usually minimal because both jobs are performed under one contractor (either by the prime contractor itself or a sub-contractor working for the prime contractor).

B) A Utility Company may request that its proposed utility relocation work to be incorporated into the MDOT SHA construction project when the MDOT SHA plans a highway or bridge project.

1. Refer to Section 8.05.03.03 (B) Utility 3rd Party Work for additional guidance.

C) If the MDOT SHA approves including the utility relocation work into the MDOT SHA construction project, the Utility will be notified through the appropriate District Engineer or their approved designee.

1. When the utility work is being accomplished as part of MDOT SHA's construction project, the Utility must commit to the utility relocation work by the MDOT SHA contractor at the price assigned to the bid items within MDOT SHA's approved construction project bid.

7.09.01 Preliminary Engineering

The preparation of the Utility 3rd Party Work Plans, Special Provisions, and Estimates (Utility 3rd Party Work PS&E's) for highway and bridge construction projects is essential in order to facilitate the utility relocation work, provide contract control, estimate utility relocation costs, and provides a uniform basis for bidding purposes.

A) MDOT SHA/Consultant Designed Relocations

When the Utility Company requests to include its utility relocation work to be included in MDOT SHA's construction project, the Utility Company may also request that its proposed utility relocation work to be designed by the MDOT SHA or MDOT SHA's consultant.

1. If the MDOT SHA performs the design of the utility relocation work with MDOT SHA design staff or with an MDOT SHA consultant, the Utility shall be responsible for its portion of the cost of the utility relocation design based on the Cost Determination for the utility relocations.

2. Refer to Section 7.03 - COST RESPONSIBILITY for additional guidance.

B) Utility Company/Consultant Designed Relocations

If the Utility Company performs the design of the utility relocation work with its own design staff or with its consultants, the Utility shall submit to the MDOT SHA, a Utility 3rd Party Work PS&E package for inclusion in MDOT SHA's construction project that is sufficiently informative and complete to provide the MDOT SHA with:

- a clear description of the relocations/work to be performed
- the sequence of work activities required
- any contract or construction needs
- a detailed estimate

1. When the Utility Company performs the design of the utility relocation work with its own design staff or with its consultants, the MDOT SHA will be responsible for its portion of the cost of the utility relocation design based on the Cost Determination for the utility relocations.

7.09.02 Utility Company Approved Subcontractors

It is understood that certain utility work requires specialized or preauthorized contractors to perform the utility's relocation work. If the utility relocation work incorporated into the MDOT SHA construction project requires specialized or preauthorized contractors, the Utility shall provide to the MDOT SHA the names and contact information for a minimum of three (3) Utility Company approved subcontractors.

1. The MDOT SHA will include the list of Utility Company approved subcontractors in the Invitation For Bids (IFB) when the MDOT SHA advertises its Construction Project.

7.09.03 Utility 3rd Party Work Plans, Special Provisions, & Estimate Package

A) Utility 3rd Party Work PS&E Packages shall be submitted to the District Utility Engineer and MDOT SHA's Project Manager for review.

1. A copy of the Utility 3rd Party Work PS&E Packages will be transmitted to Office of Construction – Utilities for review and processing.
2. Refer to Section 8.05.04.04(B) Utility 3rd Party Work for additional guidance.

B) The Utility 3rd Party Work PS&E Packages shall include the following:

1. Utility 3rd Party Work Plans
   - **a)** Refer to Section 2.02 PLANS and Section 7.09.03.01 - Utility 3rd Party Work Plans for additional guidance.
2. Utility 3rd Party Work Special Provisions
   - **a)** Refer to Section 7.09.03.02 – Utility 3rd Party Work Special Provisions for additional guidance.
3. Utility 3rd Party Work Cost Estimate
   - **a)** Refer to Section 7.09.03.03 - Utility 3rd Party Work Cost Estimates for additional guidance.
4. Utility 3rd Party Work Agreement
   - **a)** Refer to Section 2.03 AGREEMENTS and Section 7.09.03.04 - Utility 3rd Party Work Agreements for additional guidance.

C) Utility 3rd Party Work PS&E Packages shall be considered incomplete until all items have been submitted to the MDOT SHA.

1. Generalized, vague, or incomplete information will delay the review process and could potentially result in a delay in advertising MDOT SHA's contract.

7.09.03.01 Utility 3rd Party Work Plans

A) Utility 3rd Party Work Plans shall show the details of the utility relocations that are necessary to clear the project and accomplish the work in an orderly manner. The Utility 3rd Party Work Plans should be tailored to provide all information necessary for the MDOT SHA to verify that all the utility conflicts have been addressed for resolution.

1. Refer to Section 2.02.06.04 - Utility 3rd Party Work Plans for additional guidance.

B) If the Utility Company performs the design of the utility relocation work with its own design staff or with its consultants, the Utility shall submit the Utility 3rd Party Work Plan to the MDOT SHA as per Section 8.05.04.04(B) Utility 3rd Party Work.

C) If the MDOT SHA performs the design of the utility relocation work with MDOT SHA design staff or with an MDOT SHA consultant, the Utility shall be responsible to review the Utility 3rd Party Work Plan and verify that all the utility conflicts have been addressed for resolution.

7.09.03.02 Utility 3rd Party Work Special Provisions

A) The Utility shall provide sufficient information for the MDOT SHA to prepare the Special Provisions, Section 875 - Utility Statement, to be incorporated into the MDOT SHA's IFB Proposal.

1. The Utility shall submit all supporting documentation necessary for the MDOT SHA to prepare the Special Provisions, Section 875 - Utility Statement.

2. Refer to Section 7.10.01 - Utility Statement for additional guidance.

B) If the Utility Company performs the design of the utility relocation work with its own design staff or with its consultants, the Utility shall provide the utility specific Special Provisions, Section 876 thru Section 881 (as appropriate) to be incorporated into the MDOT SHA's IFB Proposal.

1. The Utility shall submit all supporting documentation necessary for the MDOT SHA to review and verify the Utility Specific Special Provisions are compatible with the MDOT SHA's IFB Proposal.

2. Refer to Section 7.10.02 - Utility Specific Special Provisions for additional guidance.

C) If the MDOT SHA performs the design of the utility relocation work with the MDOT SHA design staff or with an MDOT SHA consultant, the Utility shall be responsible to review and verify the Utility Specific Special Provisions are compatible with the Utility Company's requirements.

1. The Utility shall submit all supporting documentation necessary for the MDOT SHA to prepare the Utility Specific Special Provisions.

2. Refer to Section 7.10.02 - Utility Specific Special Provisions for additional guidance.

7.09.03.03 Utility 3rd Party Work Cost Estimate

A) The Utility 3rd Party Work Cost Estimate should be prepared and reviewed carefully to reflect as realistically and accurately as possible the expected costs of the work at the time of receipt of bids. The following items need to be verified on the Utility 3rd Party Work Cost Estimate:

- Is there a pay item for all items of work?
- Are pay units (EA, LF, LS, etc.) correct? Are unit prices correct?

- Are unit quantities correct?
- Do the pay item descriptions match Utility 3rd Party Work Plans and Utility 3rd Party Work Special Provisions?
- Are there any Category 100 Items? If so, are the items listed separately?
- Are there any lump sum items? If so, is there a lump sum breakdown that supports the figures?

B) If the Utility Company performs the design of the utility relocation work with its own design staff or with its consultants, the Utility shall provide the Utility 3rd Party Work Cost Estimate to be incorporated into MDOT SHA's Trns*Port program.

1. Refer to Section 7.10.02 - Utility Specific Special Provisions for additional guidance.

2. The Utility shall submit all supporting documentation necessary for the MDOT SHA to review and verify the Utility 3rd Party Work Cost Estimate is consistent with the Utility Specific Special Provisions.

a) Refer to Section 7.10.02 - Utility Specific Special Provisions for additional guidance.

3. MDOT SHA's Project Manager will transmit copies of the Utility 3rd Party Work Cost Estimate and utility items from MDOT SHA's Trns*Port program to the Statewide Utility Engineer.

a) Refer to Section 8.05.04.04(B) Utility 3rd Party Work for additional guidance.

C) If the MDOT SHA performs the design of the utility relocation work with MDOT SHA design staff or with an MDOT SHA consultant, the Utility shall be responsible to review and verify the Utility 3rd Party Work Cost Estimate is consistent with the Utility Specific Special Provisions.

1. The Utility shall submit all supporting documentation necessary for the MDOT SHA to prepare the Utility 3rd Party Work Cost Estimate and incorporate into MDOT SHA's Trns*Port program.

a) Refer to Section 7.10.02 - Utility Specific Special Provisions for additional guidance.

2. MDOT SHA's Project Manager will transmit copies of the Utility 3rd Party Work Cost Estimate and utility items from MDOT SHA's Trns*Port program to the Statewide Utility Engineer.

a) Refer to Section 8.05.04.04(B) Utility 3rd Party Work for additional guidance.

7.09.03.04 Utility 3rd Party Work Agreements

A) 23 CFR 645.113 states in part, "On Federal-aid and direct Federal projects involving utility relocations, the utility and the TD (Transportation Department) shall agree in writing on their separate responsibilities for financing and accomplishing the relocation work." As such, the MDOT SHA is required to have agreements with utilities in order to reimburse Utility Companies for utility relocations on highway projects.

B) For purposes of developing a Utility 3rd Party Work Agreement, several items need to be addressed such as the CE (construction engineering) Costs, Overheads, and the Category 100 Items Costs.

1. Refer to Section 7.09.04 – CE Costs for further guidance.

2. Refer to Section 7.09.05 – Overhead for further guidance.

3. Refer to Section 7.09.05 – Category 100 Items Costs for further guidance.

C) The Utility shall submit a written agreement to the MDOT SHA which identifies the Utility's and the MDOT SHA's responsibilities for financing and accomplishing the relocation work.

1. Refer to Section 8.05.03.03(B) Utility 3rd Party Work for additional guidance.

2. Refer to 23 CFR 645.105 and 107 for definitions and eligibility.

3. While no special form of written agreement is prescribed, it is recommended that a project specific agreement be used such as a Utility 3rd Party Work Agreement or a Memorandum of Understanding.

a) Refer to Section 2.03 - AGREEMENTS for further guidance.

b) Refer to Section 2.03.03 - Utility 3rd Party Work Agreement for further guidance.

c) Refer to Section 2.03.05 - Memoranda of Understanding for further guidance.

7.09.04 CE Costs

A) CE Costs are the construction and engineering costs incurred by the MDOT SHA during the construction period for each MDOT SHA project; and is comprised of the MDOT SHA's direct salaries and payroll burden for construction engineering services and other direct costs such as consultant services, testing, and materials that are applicable to the MDOT SHA project as a whole. CE Costs include MDOT SHA's construction inspection, consultants, fringe benefits, vehicles, equipment, material testing, etc. CE Costs include any other items related to the MDOT SHA staffing, inspection, and testing costs directly charged to the project.

B) The MDOT SHA may include the CE Costs in any Utility 3rd Party Work participation if the MDOT SHA is to provide construction inspection and testing on the utility (relocation and/or betterment) work to be performed by MDOT SHA's contractor and/or subcontractor for the project.

1. The MDOT SHA, at its sole discretion, may choose to not include the CE Costs for governmental (municipal or local governmental) Utility 3rd Party relocation work only provided (i) governmental entity provides its own inspection staff; and (ii) the governmental entity does not invoice the MDOT SHA for its CE Costs; and (iii) is addressed in an MOU between the MDOT SHA and the governmental entity.

2. All utility and governmental entity Utility 3rd Party betterment work will include the CE Costs. There shall be no exceptions.

C) The MDOT SHA includes the CE Costs on Utility 3rd Party (relocation and/or betterment) work as follows:

1. The Utility shall be invoiced for the Utility's portion of the CE Costs applicable to the Utility's direct (relocation and/or betterments) construction costs, which shall be calculated by multiplying the Utility's direct (relocation and/or betterments) construction costs by an ***estimated*** CE Costs percentage that will be revised at the completion of the MDOT SHA's Project. The current ***estimated*** CE Costs percentages for MDOT SHA projects are:

- Major construction projects – 15.3%
- Other construction projects – 14.4%

Note: These percentages may be revised from time to time.

2. Upon completion of the MDOT SHA's Project, the ***actual*** CE Costs percentage will be determined by dividing the total ***actual*** CE Costs incurred by the MDOT SHA for the project by the total actual direct construction costs for the project.
3. The Utility's portion of the ***actual*** CE Costs will be calculated by multiplying the total of the Utility's direct (relocation and/or betterments) construction costs by the ***actual*** CE Costs percentage.
4. Any difference between the ***estimated*** CE Costs billed to the Utility to date for the MDOT SHA Project and the ***actual*** CE Costs due for the utility (relocation and/or betterments) construction costs will be reflected as either a final invoice or a refund from the MDOT SHA to the Utility for the CE Costs for the Utility (Relocation and/or Betterments) construction costs associated with the MDOT SHA Project.

7.09.05 Overhead

A) Overhead (O/H) is MDOT SHA's administrative and general (A&G) expenses. O/H represents the costs incurred by the entire MDOT SHA in its daily operation of maintaining the State roads and are not identified with one specific project or activity. O/H includes employee salaries (i.e. finance and administrative staff), office supplies, furniture and fixture/equipment purchases, utilities, rent, insurance, etc. O/H represents all the expenses that are necessary to operate a business but are not charged directly to projects or maintenance activities and are expressed as a percentage of MDOT SHA's total direct (non-overhead) operating costs.

B) The MDOT SHA will include the O/H in all utility and governmental entity Utility 3rd Party billings.

C) O/H applies to all Utility 3rd Party (relocation and/or betterment) design and/or construction work; and CE Costs, if any. There shall be no exceptions.

D) The MDOT SHA will include the O/H on Utility 3rd Party (relocation and/or betterment) design and/or construction work; and CE Costs if any, as follows:

1. The Utility shall be invoiced for the Utility's portion of the O/H applicable to the Utility's direct (relocation and/or betterments) design and/or construction costs; and CE Costs if any, which shall be calculated by multiplying the Utility's direct (relocation and/or betterments) design and/or construction costs plus any CE Costs, by the MDOT SHA's current overhead rate **as of the date the MDOT SHA generates the invoice**. MDOT SHA's O/H overhead rate is revised annually.

7.09.06 Category 100 Items Costs

A) There may be a determination that on certain MDOT SHA's Projects with Utility 3rd Party (relocation and betterments) work there are Category 100 – Preliminary items of which the costs could be applicable to both the highway construction and the Utility construction. While each project could have additional items (or no items), typically the Category 100 – Preliminary Items that could be attributable to both the highway construction and the Utility construction are Maintenance of Traffic, Mobilization, Construction Stakeout, and Engineer's Office.

B) These Category 100 Item Costs would be determined on a case by case basis and should be identified on the MOU/Agreement with between the MDOT and the Utility.

C) The costs as identified and agreed to in the MOU/Agreement for the Category 100 Items would be calculated as follows:

1. The Utility's portion of the Category 100 Items Costs for the Utility Relocations shall be calculated as a percentage by dividing the sum of only the Utility Relocation costs, as determined by Prior Rights, by the total direct construction costs for the project.
2. The Utility's portion of the Category 100 Items Costs for the Utility Betterments shall be calculated as a percentage by dividing the sum of only the Utility Betterment costs by the total actual direct construction costs for the project.

7.10 UTILITY SPECIAL PROVISIONS

A) The Utility Special Provisions are a part of the IFB (Invitation for Bid) which is the document used for soliciting bids under procurement by competitive sealed bidding and small procurement procedures including requests for quotations.

B) Each MDOT SHA Project is unique by nature due to location, complexity, site conditions, etc. As such, the Utility Special Provisions are meant to augment and/or amend the General Conditions and Standard Specifications to address the unique features of a project and any required contract provisions of a specific utility.

7.10.01 Utility Statement

A) The Utility Statement is Section 875 of the special provisions. The Utility Statement is included in every MDOT SHA project and contains the general utility coordination information needed by the contractor. The following information should be included in the Utility Statement:

1. Utility contact person with phone number for the specific project
2. The sequence of work activities required (e.g. design, scheduling, material ordering, structure installation, plant installation, pole installation, testing, cabling, splicing, tie-ins, etc.)
   - **a)** Any lead time for any activity (e.g. scheduling, material ordering, contract procurement, etc.)
   - **b)** Duration of each activity in Working Days
3. Any advance contract or construction needs (e.g. any right-of-way needed; any permit needed; any advance work needed)
4. Any seasonal (heat or cold) and contractual limitations (labor union requirements)
5. Any restrictions on MDOT SHA's contractor with an estimate of the time such interference can be expected
6. If all of the required utility relocations will not be completed prior to NTP, do the special provisions contain a provision identifying the scope of work to be done concurrently with the contract?
7. If the right-of-way is not anticipated to be clear prior to authorization, do the special
8. provisions contain:
   - **a)** The restrictions on the contractor,
   - **b)** An estimate of the time such interference can be expected, and
   - **c)** A statement that a time extension may be granted if the property is not available as indicated? If all residents have not been relocated prior to advertisement, is there a statement that the contractor will not be allowed to proceed with the physical construction on any part of the project until the residentially improved properties have been vacated?

B) The Utility shall provide all information and documentation necessary for the MDOT SHA to prepare Section 875 – Utility Statement of the special provisions.

1. Refer to Section 8.04.04 – Plan Development (70%-90%) for additional guidance.

7.10.02 Utility Specific Special Provisions

A) Special Provisions, Sections 876 thru 881, are used specifically for Utility 3rd Party Work and contains the utility standards and specifications needed by the contractor to properly construct, adjust, relocate and/or remove the utility facilities for the MDOT SHA project. These Utility Specific Special Provisions contain the contract items for each activity the contractor is to perform for the specific utility.

1. Contract Item (Pay Item) - An item of work specifically described and for which a price, either unit or lump sum, is provided. It includes the performance of all work and the furnishing of all labor, equipment, materials, and measurement & payment as described herein or described in any Supplemental Specifications or Special Provisions.

B) The Utility Special Provision Section for each type of facility is as follows:

- Section 876 – Water & Sewer - (water mains, sanitary sewers and related structures supporting the transmission of potable water and/or removal of waste)
- Section 877 – Telephone & Fiber Optical - (poles, cable [copper & fiber], conduit, towers, electronic equipment, etc. supporting the transmission of telecom services)
- Section 878 – Electric - (poles, cable [copper & aluminum], conduit, transformers, towers, switch gears, etc. supporting the transmission of electric energy)
- Section 879 – Gas - (pipe, valves, meters, and related structures supporting the transmission of natural gas)
- Section 880 – Cable TV (CATV) - (poles, cable [coax & fiber], conduit, towers, electronic equipment, etc. supporting the transmission of television services)
- Section 881 – Railroads - (tracks, poles, cantilevers, cable [copper & aluminum], conduit, transformers, towers, switch gears, electronic equipment, etc. supporting the transportation of passengers, freight, and mail)

C) The following items need to be reviewed and addressed on any Utility Specific Special Provisions:

1. Do specifications and special provisions conflict with plans and/or estimate?

2. Are any pay items not covered by an appropriate specification in the special provisions and/or which do not agree with the plans and estimate as to basis of payment?

3. Are there any guarantee's or warranty clauses?

a) Only those guarantees or warranties given as customary trade practice for purchased materials are allowed.

4. Are there any proprietary items? If so, has one of the following options been employed:

a) A letter to the SHA Deputy Administrator/Chief Engineer for Planning and Engineering formally requesting approval of the use of the proprietary item(s) on this project. The letter needs to justify the reasons for the use of each proprietary item; or,

b) List a minimum of three [3] items and its manufacturer followed by "or as approved by the engineer"; or,

c) Delete the reference to the proprietary item.

5. Are any materials being supplied by the Utility Company?

D) If the Utility Company performs the design of the utility relocation work with its own design staff or with its consultants, the Utility shall provide the utility specific Special Provisions, Section 876 thru Section 881 (as appropriate) to be incorporated into MDOT SHA's IFB Proposal.

1. The Utility shall submit all supporting documentation necessary for the MDOT SHA to review and verify the Utility Specific Special Provisions are compatible with the MDOT SHA's IFB Proposal.

E) If the MDOT SHA performs the design of the utility relocation work with MDOT SHA design staff or with an MDOT SHA consultant, the Utility shall be responsible to review and verify the Utility Specific Special Provisions are compatible with the Utility Company's requirements.

1. The Utility shall submit all supporting documentation necessary for the MDOT SHA to prepare the Utility Specific Special Provisions.

7.11 INCENTIVES & DELAY CLAIMS

7.11.01 Incentives

A) Project delays during the construction of highway projects due to utility relocations are exasperating to both highway and utility agencies. At times the MDOT SHA will attempt to address potential the utility conflicts with the highway construction schedules by the use of incentives. Some incentives have been in the form of financial incentives and some in the form of non-financial incentives. The results of these initiatives have been varied.

B) While the MDOT SHA is open to using incentives; the expectation is that, when incentives are agreed to, the Utilities will commit to meeting or exceeding project delivery schedules. The following is a list of financial and non-financial incentives that the MDOT SHA uses, has used or will consider using:

1. Financial Incentives

- Reimbursement
- Construction Stakeout
- Right-of-Way Acquisition for Utilities
- Clearing & Grubbing
- Grading
- Lump Sum

2. Non-Financial Incentives

- Coordination, Cooperation, Communication (CCC)
- Highway Contract Language Facilitating CCC
- Utilities in Design-Build Projects
- Subsurface Utility Engineering (SUE)
- Utility Work by Highway Contractors
- Utilities in Value Engineering
- High-Level Memorandums of Understanding (MOU)

- Identification of Abandoned or Out-of-Service Utilities
- Designated Utility Coordinators
- Utility Coordination During Construction
- Combined Project Segments

7.11.02 Delay Claims

A) When the MDOT SHA proposes a construction project, the Utilities have an obligation to comply promptly with any order or request of the MDOT SHA to perform the work necessary to relocate its facilities. This is necessary in order to meet project schedules.

1. Refer to Section 1.05- AUTHORITY for additional guidance.

B) The indicators to verify that the Utility is actively working to meet the MDOT SHA's project delivery schedule are:

1. The Utility provided updated estimates and design & construction schedules at:

a) Planning Phase

i. Refer to Section 8.05.01 - Planning Phase for additional information.

b) Utility Preliminary Investigation (UPI) Meeting

i. Refer to 8.05.03.02 - Utility Preliminary Investigation (UPI) Meeting for additional information.

c) Utility Semi-Final Coordination Meeting

i. Refer to 8.05.04.03 - Utility Semi-Final Coordination Meeting for additional information.

d) Utility Final Review Coordination Meeting

i. Refer to 8.05.05.03 - Utility Final Review Coordination Meeting for additional information.

2. The Utility submitted its Utility Relocation PS&E Package and performed relocations diligently based on the contract schedule and in a timely manner.

a) Refer to 8.05.04.04 (A) General for additional information.

C) The Utility shall be responsible for claims against the MDOT SHA if those claims were costs incurred by MDOT SHA's Contractor which were caused by or which grew out of the failure of the Utility to carry out and complete its work in a timely and reasonable manner.

D) The MDOT SHA shall require the Utility to reimburse the MDOT SHA for any contractors delay claim received on an MDOT SHA project for which, if in MDOT SHA's judgment, the utility failed to relocate its facilities in a timely manner resulting in the MDOT SHA contractors delay.

CHAPTER 8

PROJECT COORDINATION

8.01 GENERAL

8.01.01 Introduction

This Chapter - PROJECT COORDINATION details utility relocation best practices, through Communication, Cooperation, and Coordination (CCC), regardless of the project delivery method. The partnership of MDOT SHA and the Utility Companies will foster a collaborative environment whereby the team can achieve goals that otherwise cannot be achieved working in a "silo."

The milestones, steps, and processes outlined in this guideline are intended to assist in the coordination of utilities impacted by MDOT SHA projects. Specifically, the milestones, steps, and processes will aid in timely estimate costs, develop relocation strategies, establish relocation durations, and determine right-of-way needs during the major stages of MDOT SHA's project development process. This guideline will focus on facilitating consensus for utility designs and commitment from Utility Companies based on the MDOT SHA's current Project Development Process Manual Milestones, Utility Manual, and Utility Procedures. Successful utility coordination relies heavily on efforts made by all stakeholders to identify and resolve utility conflicts through avoidance, minimization, and mitigation in the early phases of project development. Assessing these impacts at early stages of design offers a better opportunity to: take the necessary steps to minimize utility conflicts; identify right-of-way and critical parcels for utility relocation needs; set and maintain schedules in order to avoid project delays; and control costs. Implementation of disciplined, well documented, and executable processes for Utility Coordination throughout the design and construction process will result in projects that are advertised with clear stakeholder responsibility for utility relocations. This will provide accountability for both the MDOT SHA and the Utility Companies, and will result in improved project delivery.

This guideline is not intended to serve as a complete Utility Coordination Process or to address all items necessary in a Utility Manual. It is, however, intended to highlight the interaction and responsibilities between the MDOT SHA internally and the Utility Companies externally to result in timely and accurate relocations of existing utilities impacted by highway projects. This guideline will address **both roles and responsibilities** of major stakeholders involved in the Utility Coordination Process; and the important Utility Coordination items that need to be addressed throughout the various milestones of the project development process. When these are followed, they will ensure a successfully designed and constructed project.

8.01.01.02 Coordination, Cooperation, and Communication

Delivering an MDOT SHA project can seem challenging at times. Issues with design, drainage, utilities, the environment, and specific project requirements are complex and interwoven. As a result, coordinating between the Utility Owners impacted by MDOT SHA's projects and the MDOT SHA represents a significant effort by all stakeholders.

It is essential for all parties to Communicate, Cooperate, and Coordinate (CCC) in partnering at the beginning of the project development process. CCC should include essential design and construction personnel who are familiar with the project as well as other offices or support sections. The Utility Owner's cooperation is critical. Project utility coordination efforts typically focus on preliminary project design issues; however, it is essential for CCC to continue into construction.

Effective coordination requires both sincere cooperation and constant communication between all stakeholders. Early coordination efforts using CCC between impacted utilities and the MDOT SHA will help minimize miscommunication; prevent potential for project delays; and avoid project cost overruns.

CCC will foster a productive environment in which the affected utilities and the MDOT SHA can exchange mutual concerns and establish realistic objectives can yield mutually beneficial results by avoiding the setting of unrealistic expectations that can be difficult to achieve. Successful facilitation of utility conflict resolution issues involves an understanding that both parties share responsibility in the mitigation of utility impacts.

8.01.02 Risk Management Approach to Utility Coordination

The Utility Coordination Process identified in this chapter is intended to be modified to meet the needs of the individual project. No two projects are identical. Site conditions, magnitude of utility impacts, or the type of project delivery can vary from one project to another. Projects that are high profile or environmentally sensitive can affect the level of utility coordination required. As such, the MDOT SHA has taken the approach of Risk Management to Utility Coordination to determine the level of coordination needed for any specific project.

Risk management is the process of identifying risk, assessing risk, and taking steps to reduce risk to an acceptable level. The risk management approach determines the processes, techniques, tools, and team roles and responsibilities for a specific project.

This Chapter 8 – Project Coordination has been developed to address the "typical" Design-Bid-Build type of project needing extensive utility coordination. However, the project stakeholders need to: evaluate each project on a case by case basis; come to a consensus as to how much coordination is needed; and what, if any, modifications are needed to the "typical" process identified in this chapter.

To assist in this risk management approach, refer to the Appendix - FUNDING CATEGORIES & UTILITY COORDINATION for guidance on the funding categories for projects, the general type of work for these projects, and the "typical" level of utility impacts to start a Risk Management approach to Utility Coordination for an individual project.

In addition, refer to Alternative Project Delivery Methods at https://www.roads.maryland.gov/mdotsha/pages/Index.aspx?PageId=131 for information on some of the alternative methods of Project Delivery such as Design-Build, Contract Manager at Risk (CMAR), Progressive Design-Build, etc. Alternative project delivery methods will require modifications in how the Utility Coordination Process will be applied to that specific project.

8.01.03 Definitions

Designating or Designation: The process of using surface geophysical methods to determine the presence of a subsurface utility and to mark its approximate horizontal position (its designation) on the ground surface.

Note: Some Utility Owners and/or contractors may call this "locating" in reference to Miss Utility.
Locating: The process of exposing and recording the precise vertical and horizontal location of a utility. Locating is SUE QL-A process of exposing (i.e. test holes, not pits). Not to be confused with Miss Utility Maryland locates, (i.e. calling Miss Utility to mark underground utilities)

Miss Utility: A one-call notification center that informs subscribing facility/utility owner-members of proposed excavation (Locate Tickets) or of requests for projects in the planning phase (Designer Tickets). The following are a few of the types of "tickets" available from Miss Utility:

- **Locate Tickets:** The facility/utility owner–member marks their underground facility if the proposed excavation or demolition is within 5 feet of the horizontal plane of the underground facility.
- **Designer Tickets:** The utility owner-member has the option of sending records to the designer or designate and mark on the ground surface the existing indications of some or all of the utilities that may be present.
- **Information Tickets:** This is similar to Designer Tickets except that the ticket is cancelled before it is sent. This will provide a list of utility owner-members with contact information that may have facilities present in the area to the requesting designer. No tickets are transmitted to the utility owner-members. Note: The list of utility owner-members must be copied and saved prior to cancelling the ticket.

Subsurface Utility Engineering (SUE): A branch of engineering practice that involves managing certain risks associated with utility mapping at appropriate quality levels, utility coordination, utility relocation design and coordination utility condition assessment, communication of utility data to concerned parties, utility relocation cost estimates, implementation of utility accommodation policies, and utility design.

Utility Depiction: A visual image of existing utility information using a computer-aided design and drafting system or on project plan sheets.

Utility Quality Level (QL): A professional opinion of the quality and reliability of utility information. Such reliability is determined by the means and methods of the professional and is established by different methods of data collection and interpretation.

There are four different quality levels of utility information as defined by the American Society of Civil Engineers Standard CI/ASCE 38-02 which are as follows:

- **Quality Level A (QL-A)** – Precise horizontal and vertical location of utilities obtained by actual exposure or verification of previously exposed surveyed utilities and subsequent measurement of subsurface utilities, usually at a specific point (e.g. test hole). Minimally intrusive excavation equipment is typically used to lessen the potential of utility damage. A precise horizontal and vertical location, as well as other utility attributes, is shown on plan documents.
- **Quality Level B (QL-B)** – Information obtained through the application of appropriate surface geophysical methods to determine the existence and approximate horizontal position of subsurface utilities. QL-B data should be reproducible by surface geophysics at any point of their depiction. This information is surveyed to the applicable tolerances defined by the project and reduced onto plan documents.
- **Quality Level C (QL-C)** – Information obtained by surveying and plotting visible above ground utility features and by using professional judgment in correlating this information to QL-D information.
- **Quality Level D (QL-D)** – Information derived from existing records or oral recollections.

Utility Relocation Strategies: Are educated decisions regarding how to relocate utilities based on specific project requirements. Refer to Section 8.04.03 Strategies for more information.

8.02 GUIDANCE DOCUMENTS for PROJECT COORDINATION

The following documents and training links should be utilized to more fully understand, implement and facilitate coordination, cooperation and communication on MDOT SHA projects:

- Viewing and Discussion Guide CCC: Making the Effort Works!
- NHI - Introduction to Utility Coordination for Highway Projects--WEB-BASED
- S2-R15B-RW-1: Identification of Utility Conflicts and Solutions
  Training Materials (Utility Conflict Matrix)
- Consolidated Transportation Program (CTP)
- MDOT SHA's Monthly Advertisement (AD) Schedule

8.03 ROLES AND RESPONSIBILITIES

The following are identified as critical positions for utility coordination in the project delivery process. The personnel filling these positions are the key coordinators, facilitators, and decision makers for utility coordination on MDOT SHA projects. These comprise the core of the Project Development Team for utility coordination. The positions described are not intended to be all inclusive of the positions necessary for the Project Development Team, but the team should include these individuals or groups at a minimum.

This is an attempt to provide guidance for the positions described below. These descriptions are not meant to be all inclusive or indicative of all roles, responsibilities, or duties of a position, or be the sole position description for anyone, but it is intended to clarify expectations to better coordinate and collaborate with regard to utility issues. In addition, the positions listed below are in alphabetical order as some positions, responsibilities and organizational locations may overlap on a project by project basis.

The Project Delivery Team should identify potential conflicts and proactively work to avoid utility conflicts, minimize the magnitude of the impacts with utilities and coordinate utility relocation efforts to eliminate potential project delays. In order to avoid costly utility relocation delays during the construction phase of the project, regular and meaningful coordination with the Project Development Team is essential.

8.03.01 Assistant District Engineer for Construction and/or Area Engineer

The ADE for Construction and Area Engineer maintain overall administrative QA/QC oversight for the construction phase for all projects and are part of the MDOT SHA Project Utility Issue Resolution chain. The ADE for Construction and Area Engineer are responsible for:

- Providing expert guidance in determining the most appropriate means and methods for utility relocations.
- Working with Project Managers, Project Engineers, Utility Companies, DUE's, etc., to evaluate sequence of construction and constructability.
- Recommending the appropriate relocation strategies (i.e. utility breakout project, utility relocations prior to NTP, Utility 3rd Party work, concurrent utility work) for the project.
- Reviewing preliminary construction schedules and timeframes for utility work required prior to the construction contract NTP, concurrent utility work, and its work flow with the MDOT SHA contract.
- Providing input and concurrence on timeframes (utility & MDOT SHA construction), sequence of construction, and constructability.
- Attending project level meetings and monthly District Engineer meetings.

8.03.02 Assistant District Engineer for Project Development

The Assistant District Engineer (ADE) for Project Development is the direct supervisor of the District Utility Engineer (DUE) and is part of the MDOT SHA Project Utility Issue Resolution chain. The ADE for Project Development:

- May act as Project Manager (see project manager).
- May supervise District Project Designers and Project Managers.
- Attends all monthly District Engineer meetings.

8.03.03 Designers

Designers (lead and support as appropriate) may be from various disciplines related to the project including, but not limited to geometric design, drainage/stormwater management/erosion and sediment control, traffic, etc. These positions are responsible to assist the Project Manager in evaluating potential utility conflicts, provide recommendations and determine if they can be reduced, minimized, or eliminated at the Project Manager's discretion. They are responsible for:

- Assisting, maintaining, and developing the Utility Conflict Matrix (UCM) at the project level.
- Assisting the Project Manager in evaluating potential utility conflicts.
- Providing recommendations and determine if utility conflicts can be reduced, minimized, or eliminated at the Project Manager's discretion.
- Attending project level meetings.

8.03.04 District Engineer

The District Engineer (DE) is key decision maker and is part of the MDOT SHA Project Utility Issue Resolution chain. The District Engineer:

- Is the key facilitator for monthly District Advertisement schedule review meetings which should identify utility issues.
- Provides information and guidance to other key decision makers to investigate and develop potential resolutions or mitigation.

8.03.05 District Right-of-way Chief

The District Right-of-way (R/W) Chief is a key decision maker in feasibility for right-of-way acquisition related to utilities. The R/W Chief is responsible for:

- Providing input and guidance on the appropriate type of right-of-way (e.g. fee right-of-way, perpetual easement for utility purposes, etc.) to be acquired as part of MDOT SHA acquisitions to accommodate utility relocations.
- Coordinating and developing, along with the Project Manager, realistic right-of-way clearance dates related to utility work required prior to the construction contract NTP so as to minimize concurrent utility work.
- Attending project level meetings and monthly District Engineer meetings.

8.03.06 District Utility Engineer (DUE)

The DUE is MDOT SHA's key facilitator for utility coordination with the Utility Companies on all MDOT SHA projects and is part of the MDOT SHA Project Utility Issue Resolution chain. The DUE is responsible to:

- Transmit project level information and decisions to and from the Utility Companies and the MDOT SHA.
- Ensures all environmental commitments and any nearby sensitive resources are communicated to Utility Companies.
- Attends all project level meetings and District Engineer meetings as required.

- Attends utility status meetings conducted by the Statewide Utility Engineer.
- Assists in the development and maintenance of the Utility Conflict Matrix (UCM) for all projects.
- Schedules and conducts utility coordination meetings as needed throughout the plan review process which includes but not limited to: Utility Preliminary Investigation (UPI); Utility Semi-Final (USF); Utility Final Review (UFR); and ensures attendance by all utilities impacted, documents issues and decisions discussed, and resolutions needed, prepares and distributes the Utility Reports.
- Identifies and requests needed information from Utility Companies.
- Ensures the Utility Companies provide information needed for cost estimates, schedules, and right-of-way needs to the MDOT SHA in a timely manner.
- Coordinates with the Project Manager to identify when and what Utility Designation Quality Level is needed based on the project scope, existing data, etc. (NOTE: Quality Level C minimum, Quality Level B/A as required).
- Coordinates with the Project Manager early in design to determine the need for the MDOT SHA to develop utility concepts for Preliminary Investigation.
- Initiates and facilitates the Prior Rights process.
- Collaborates with Utilities to develop Utility Analysis Reports (Form UC-3) as they relate to each project and provides the information to the Statewide Utility Engineer.
- Processes the Utility Relocation PS&E package which includes reviewing property rights and cost break downs if it is a joint funded project.
- Provides utility cost estimates to the Project Manager for inclusion in the Project Form 42 and setting up utility relocation funding Form 30.
- Revises Form 42's for any changes to utility relocation costs after the final Form 42 has been approved.
- At the PI, DUE requests any As-Built Plans not provided to the Utility Survey Supervisor at the time of the initial designation and/or make Utility Representative aware a request for As-Built Plans will be on the way if designation hasn't taken place.

  NOTE: DUE does not coordinate SHA owned utility facilities. (SHA communication lines, OOTS/street lights, signs and signals, weather stations, Automated Traffic Recorders)

8.03.07 Environmental Manager

The role of the Environmental Manager (EM) is to determine the whether any sensitive environmental resources are located within the utility areas, complete the required environmental technical analyses, and obtain environmental approvals in a timely manner. Once the scope of work and LOD are received, the EM is responsible for:

- Conducting an environmental inventory to identify any environmental resources within the utility LOD;
- Notifying the PM/Design Engineer (DE) of the location of these environmental resources;
- Working with the PM/DE to avoid/minimize potential sensitive areas;
- Coordinating with EPLD technical leads to determine the level of environmental analyses required (ie., cultural resources, hazardous materials, rare/threaten endangered species) and the timeframe needed to complete these analyses;
- Completing the environmental analyses;
- Coordinating with the appropriate regulatory agencies to obtain their comments/clearance/approval;

- Compiling the results of the analyses and agency coordination efforts and preparing the appropriate environmental document;
- Communicating any special provisions to the PM/DE for inclusion in the plans and IFB.

8.03.08 Independent Construction Engineer

Independent Construction Engineers (in-house or consultant) may be provided by the Lead Design Office or the District Office as needed. Independent Construction Engineers are responsible for:

- Providing engineering reviews, constructability reviews, and input to identify utility impacts (based on both design plans and construction activities/requirements) and develop avoidance alternatives.
- Developing possible alternatives for utility impact avoidance, sequence of construction, utility phasing (utility work to be performed prior to MDOT SHA's NTP and/or utility work concurrent with MDOT SHA's project), construction schedules, etc. to accommodate project requirements.
- Lead and/or support the development and updating of the Utility Conflict Matrix.

8.03.09 Plats & Surveys - Utility Survey Supervisor

The Utility Survey Supervisor initiates the Subsurface Utility Engineering (SUE) work based on the Project Manager's requests and is responsible for:

- Requesting necessary consultant resources who will perform the utility designations.
- Reviewing consultant utility deliverables.
- Working with the Project Manager and District Utility Engineer to review and/or develop Quality Level A needs.

8.03.10 Plats & Surveys - Plat Engineer

This position incorporates Utility Company right-of-way needs into plat development at the project level. The Plat Engineer:

- Provides input and guidance on the appropriate right-of-way type (e.g. fee right-of-way, perpetual easement for utility purposes, etc.) to be acquired as part of MDOT SHA acquisitions to accommodate utility relocations.
- Attends project level meetings upon request to provide expertise and assist with issue resolution.

8.03.11 Project Manager

The Project Manager (Design - District, OHD, OOS, OOTS, etc.) is MDOT SHA's leader for project delivery and incorporates the key elements related to utility costs and schedules into the overall project costs and schedule. The Project Manager is responsible:

- To be the key facilitator of project design meetings (monthly, milestone), discuss how utilities are to be coordinated for utility design and relocation at the project level.
- For documenting issues and resolutions that need to be resolved at the project level.
- For ensuring the utility relocation costs are accurately incorporated into the overall project costs.
- For ensuring utility relocations are incorporated into the overall project schedule.
- For ensuring and facilitating early participation and coordination by critical utility coordination staff.
- For ensuring any nearby sensitive resources are identified for the utility companies to avoid or minimize impacts.

- For ensuring all environmental impacts from utility relocations are accounted for in the overall project impacts discussed in the environmental document.
- For initiating any requests for utility identification and determining the Utility Quality Level necessary in collaboration with the District Utility Engineer.
- For identifying the need for utility relocation concepts at an early stage in project development in cooperation with the District Utility Engineer and project team.
- To be the key decision maker in determining the sequence of construction.
- To work with the Designers to evaluate potential utility conflicts and determine, to the maximum extent practicable, if those conflicts can be reduced, minimized, or eliminated based on the purpose and need of the project and assess any safety implications.
- For the initial development of the Utility Conflict Matrix (UCM) at the project level and for providing cost and schedule information for the UCM updates that are completed by the District Utility Engineer.
- For developing the Form 42's to include utility relocation costs received from the District Utility Engineer.

8.03.12 Statewide Utility Engineer

The Statewide Utility Engineer is a key facilitator for utility coordination with the Utility Companies and is part of the MDOT SHA Project Utility Issue Resolution chain. The Statewide Utility Engineer is responsible for:

- Establishing and maintaining MDOT SHA's Utility policies and procedures.
- Ensuring MDOT SHA's Utility policies and procedures are implemented and executed consistently statewide by the District Utility Engineers.
- Providing information and decisions to and from the Utility Companies and the MDOT SHA.
- Overseeing utility coordination activities with the District Utility Engineers.
- Reviewing and discussing the UPI Reports, USF Coordination Meeting Reports, UFR Coordination Meeting Reports, and Utility Status Reports prepared by the District Utility Engineer on each project.
- Providing the utility clear dates or months required for the Advertisement Schedule on all projects (financial and production) based on input from the District Utility Engineers.
- Conducting regular utility coordination meetings with the Utility Companies by geographic area as needed.
- Reviewing and processing Utility Relocation PS&E's and Utility 3rd Party Work PS&E's which includes determining final utility costs, betterments and salvaged materials.
- Submits Utility Relocation PS&E's to FHWA for federal funding, as needed, if ≥ $100k.

8.03.13 Utility Companies

The owner of a utility located within the MDOT SHA's right-of-way has an obligation to contribute to the project delivery process and relocate its facilities to a location in a timeframe that is mutually agreeable and beneficial to both the MDOT SHA and the Utility Owner. However, Utility Owners also have a reasonable and justified expectation that they will be kept informed of pertinent project details, so they can schedule the necessary time and resources to meet their relocation requirements.

Utility Companies are critical in the project development process and are key Stakeholders and are responsible for:

- Providing utility relocation cost and time estimates for design and construction as well as other pertinent information to the MDOT SHA through the District Utility Engineers and the Statewide Utility Engineer.
- Reviewing MDOT SHA project plans and utility concepts from other Utility Companies.

- Providing early input on any additional right-of-way needs to accommodate utility relocations.
- Providing input on utility locations, potential utility impacts, and relocation requirements.
- Developing utility concepts for MDOT SHA projects in coordination with the Project Manager and the District Utility Engineer early in MDOT SHA's design process.
- Assisting in the development and maintenance of the Utility Conflict Matrix (UCM) for all projects.
- Providing pertinent information and collaborating with the District Utility Engineer to develop Utility Analysis Reports (Form UC-3) as they relate to each project.
- Attending Utility Preliminary Investigation (UPI) Meetings, Utility Semi-Final (USF) Coordination Meetings, Utility Final Review (UFR) Coordination Meetings, and monthly Statewide Utility Engineer meetings to identify needs, provide information, and discuss issues and resolutions including costs, schedules, concurrent vs. work performed prior to MDOT SHA's NTP, work requirements, inclusion in the MDOT SHA contract, etc.
- Providing guidelines, requirements, specifications, and approved plans for utility work to be included in the MDOT SHA contract.
- Providing information for and facilitating the Prior Rights process.
- Providing plans for utility work to be performed prior to the MDOT SHA's NTP or utility work concurrent with MDOT SHA's project.
- Providing plans for utility work to be included in MDOT SHA's project advertisement package.
- Providing utility relocation and betterment As-Built Plans to the MDOT SHA after construction.

8.03.14 Utility Coordinator - Construction

On MDOT SHA projects, the Contractor is responsible for coordinating its sequence of construction with the utility owners and with utility work to be performed by or on behalf of utility owners. As such the contractor's superintendent will assume the responsibilities of the Utility Coordinator – Construction for the project. On major projects requiring complex or significant utility coordination, the contractor will have an individual specifically assigned as the Utility Coordinator – Construction. The Utility Coordinator – Construction shall be responsible for:

- Keeping utility owners well informed of construction schedules and notifies the utility owners at least 3 business days in advance of any work near the utility owners' facilities (other than on the utility owner's own facilities) and providing all other notifications to utility owners of utility owner obligations, Contractor activities, etc. as required by the Utility Agreements.
- Keeping utility owners well informed of changes that affect their own Utility facilities.
- Providing the utility owners at least 14 business days prior notice of potential impacts to service.
- Ensuring that utility owners are involved in making the decisions that affect their own facilities so that utility owners can provide uninterrupted service to customers or to minimize interruption of those services.
- Coordinating the Contractor's sequence of construction and utility relocations with the temperature, seasonal or other constraints associated with any required outages of utility services.
- Cooperating with the utility owners to solve relocation/installation issues consistent with the scope of the Contractor's work as otherwise set forth in the Contract Documents and without causing the MDOT SHA to incur any unnecessary expense to the Project, or the utility owners;
- Acting diligently in continuing the positive relationship that the MDOT SHA has developed with the utility owners.

- Coordinating with those utility owners who perform their own utility work (either with their own forces or through a contractor) by scheduling adequate time to accomplish the utility work.
- Reviewing each utility facility and consider its effect on the Project. If necessary, physically confirm the presence of underground facilities in areas of potential conflict by test pits or other means/methods prior to the start of work.
- Developing procedures for addressing utility conflicts discovered during construction.
- Developing, negotiating and providing a schedule in coordination with the utility owners for the design and construction of all Relocations. Identifying critical activities and sequences as they affect the utility owners and plan to effectively mitigate impacts.
- Coordinating, cooperating, and working with the individuals on the Contractor's utility contact list.
- Notifying the MDOT SHA in advance of any meeting with a utility owner's representative scheduled by the Contractor and allow the MDOT SHA the opportunity to participate in the meeting. The Utility Coordinator – Construction shall also provide to the MDOT SHA copies of all correspondence between the Contractor and any utility owner, within seven (7) business days after receipt of sending, as applicable.
- Monitoring the progress of utility owner work and notifying the MDOT SHA if the Contractor has cause to believe that the utility owner will not meet specified time frame(s) for construction, relocation, abandonment, or removal of utility-owned facilities. (which notice shall be provided to the MDOT SHA within 24 hours of discovery).
- Providing support to the MDOT SHA as requested.

8.03.15 Utility Coordinator - Design

From time to time MDOT projects may require significant or extensive coordination which exceeds the staffing resources of the MDOT SHA District Utility Teams. This may arise from extensive utility impacts on major Design-Bid-Build projects or significant coordination required for the construction phasing of a project with concurrent utility relocation work. This may also arise for specialty projects such as Design-Build or Public–Private Partnership (PPP, 3P or P3) projects. A Utility Coordinator may be solicited by a consultant contract source for a qualified individual as a task assignment(s) to provide additional utility coordination assistance for: MDOT project(s); the District Utility Team; and/or the design Project Manager. A Utility Coordinator would report to the DUE and perform the functions similar to a Utility Relocation Specialist. The main difference between the Utility Relocation Specialist and the Utility Coordinator would be the Utility Coordinator remains on the task assignment(s).

8.03.16 Utility Relocation Specialist

This is typically a member of the District Utilities staff and the position duties may also be performed by a consultant under MDOT, MDOT SHA, or other TBU's contracts. The Utility Relocation Specialist reports to the MDOT SHA DUE and is responsible for:

- Being assigned by the DUE as the contact for coordination between the MDOT SHA and Utility Owner on Project(s).
- Performing the initial review of the MDOT SHA Production Ad Schedule to start the Potential Utility Impact Questionnaire (Form UC-2) process with Utility Owner Representatives.
- Coordinating Utility Meetings with Projects Managers, District Utility Team members and the Utility Owner Representatives for: UPI (30%), Semi-Final (65%), and if warranted, Final (90%)

- Having Utility Owner Representatives complete and submit the Utility Analysis Report (Form UC-3) at each Milestone.
- Recording minutes from meetings and notifying the DUE and OOC – Utilities Team of any "out of the normal" facilities restraints or requirements.
- Performing field reviews as required for the UPI meetings and verifying all utilities facilities are accounted for in project limits, as well as recording on the RW-57 forms.
- Preparing RW-57 Form for submittal to ORE - Records and Research Department.
- Tracking Utility 3rd party requests for Utility Relocation work to be included in the project; developing the Agreements Checklist as assigned by the DUE; and notifying the OOC – Utilities Team.
- Preparing the USR(s) with utility relocation timelines for design, construction, and any type of lead time that may require additional scheduling, material ordering, contract procurement, etc. including any complications.
- Updating Utility Status Reports as needed and delivering to OOC – Statewide Utilities monthly as assigned by DUE.
- Any other duties as assigned regarding utility relocations for an MDOT TBU.

8.04 SCHEDULES, GOALS, STRATEGIES, and DOCUMENTATION

The Project Development Team should approach utility relocations systematically during the development phase of highway projects. Developing a Utility Conflict Matrix (UCM) early in the project development process allows the development of goals, strategies, and expected milestones that will facilitate appropriate and timely utility conflict resolution throughout the process. It also serves as a template for measuring the progress and success of utility conflict resolution early in the project and helps prioritize and focus resources at later project stages.

Involvement beginning at the Project Initiation meeting provides opportunities to work with various project stakeholders to discuss utility conflict goals and strategies. Some projects will have few utility conflicts and will require little effort to resolve them. Other projects will have extensive utility conflict resolution issues and will require more involvement and effort by the Project Development Team. Establishing conflict resolution goals and strategies early will also assist in forecasting the resources that will be necessary to meet those goals.

8.04.01 Schedules

Relocations of even a short section of buried utility line or a small number of utility poles can easily result in a utility construction project whose scope is larger than anticipated by the MDOT SHA. This may in turn have an adverse effect on the project delivery schedule.

The Project Development Team should incorporate utility relocation requirements into the overall project schedule to avoid project delays and provide a realistic project schedule. This includes providing Utility Owners enough time to plan and engineer utility relocations, budget funds, comply with environmental and permit requirements, negotiate real estate transactions, order and receive materials, and schedule construction crews. Like the MDOT SHA, Utility Companies often must advertise and award bids for relocation work.

A) Highway Project Schedule and Design Changes

The effects upon utility relocations should also be taken into account when considering highway improvement project scheduling and design changes. Design changes that affect expected relocations add time and expense to Utility Owners' relocation plans. It should be

noted that some design changes occur which are beyond the Project Development Team's control. Therefore, maintaining regular communication throughout the project development process is vital in facilitating both the MDOT SHA and the affected Utility Owners needs to minimize the effect on the project's scheduled Advertisement Date.

If there are any significant project scheduling and design changes that affect the Project Schedule, the issue(s) should be escalated as per the Utility Issue Resolution Flowchart so issue(s) are evaluated & resolved by the appropriate decision makers.

8.04.02 Goals

The primary goal of any unavoidable utility conflict should be to relocate the utility before construction begins. However, this is often not possible when utility relocation is dependent upon the acquisition of right-of-way or the construction of a highway element such as a utility conduit on a bridge, major earthwork, or environmental permitting. Regardless of the utility conflict, solutions should be identified, and goals established as early as possible for each conflict resolution.

8.04.03 Strategies

Developing an effective strategy to deal with various utility elements helps to facilitate the overall conflict resolution objective. The following may help in developing strategies to achieve the goals:

- What needs to happen in order to achieve a specific utility conflict resolution?
- Does a strategy include advancing certain design work to minimize or avoid a utility conflict?
- Will changing a design element minimize the conflict?
- Does the strategy benefit the state?

Many variables may be present and available to influence overall goals and strategies and will differ considerably between projects. Other issues that may influence utility conflict resolution strategy include the following:

- Multiple utilities
- Right-of-way limitations
- Project schedules
- Political commitments
- Environmental requirements
- Tree trimming and/or grading requirements
- Agreements/Commitments

The following are a few, but not all, possible strategies for relocating utilities:

- **Advanced Utility Work/Relocation** is utility relocation work that has excessive lead times or construction duration requirements and requires relocations begin prior to MDOT SHA's funding of the project for construction. This strategy requires careful review and MDOT SHA Senior Management approval as it requires advancing funding into the Preliminary Engineering or Right-of-Way Phases of a project.

- **Breakout Project:** is a project where a portion of the work contained in the main contract is advertised separately and in advance of the main contract. Work contained in the Breakout Project is necessary in order for the utilities to begin relocations. Breakout Projects may also contain Utility 3rd Party Work.

- **Utility Work/Relocations Prior to NTP:** is utility relocation work performed by the Utility prior to the Notice to Proceed (NTP) given to MDOT SHA's contractor. This is considered as the **standard utility relocation strategy**.

- **Contract Included Utility Work/ Utility 3rd Party Work:** is utility relocation work included into the MDOT SHA contract and performed by MDOT SHA's contractor.
- **Concurrent Utility Work:** is utility relocation work performed by the Utility Company which is concurrent with the MDOT SHA contractor's operations. This requires careful review and coordination to ensure that both the Utility work and the MDOT SHA contractor's operations are compatible.

Developing an effective utility strategy involves the consideration of all variables within a project and represents a contingency approach that can offer the greatest and most efficient project benefit for resolution of utility conflicts.

8.04.04 Documentation

To ensure success, it is important to approach the utility relocation process with a cooperative attitude and clearly document all phases of the utility relocations. To assist in this effort, the MDOT SHA has adopted the use of the Utility Conflict Matrix to identify and track utility conflicts to resolution. However, all correspondence, diaries, plans, meeting notes, and other information should be organized and maintained in the project/ProjectWise files. These documents should clearly illustrate and support the steps the Project Development Team has taken in the Utility Conflict Matrix to resolve any utility conflicts.

8.05 PROJECT MILESTONES

8.05.01 Planning Phase

Early recognition of utilities located within the project limits is crucial to the overall success of an MDOT SHA project. It is likely that all proposed MDOT SHA projects will involve some type of a utility facility within the highway right-of-way. Utilities have the potential to impact the project; therefore, early recognition will help avoid schedule and budgetary impacts in later stages when the project is more established and recovery from unexpected project redesign or utility relocation coordination conflicts can be more difficult to overcome.

Utility coordination is frequently overlooked in the Project Planning phase of a proposed project by the MDOT SHA and the Utility Companies because proposed construction dates tend to be so far into the future that the information may not seem relevant.

By initiating research during the planning phase to identify basic information on existing utility facilities along with **potential** estimates on relocation costs, design and construction timeframes, the Utility Companies can provide vital utility information early in the project development. This greatly assists the MDOT SHA in establishing realistic project delivery schedules and cost estimates as projects progress from Project Planning through Highway Design. These planned projects are generally found in the Consolidated Transportation Program (CTP).

The DUE shall periodically request utility coordination information for projects in planning from the Utility Companies. The DUE should compile a list of potential utilities within the proposed project by submitting a Miss Utility Information Ticket to identify the underground utilities, and requesting pole inventories as described in Section 8.05.02.01 (c) – Aerial Facilities to identify the aerial utilities.

8.05.01.01 Potential Utility Impact Questionnaire

Upon compiling the list for both the aerial and underground Utility Companies, the DUE shall send a letter with the project location and scope of work; the Potential Utility Impact Questionnaire

(Form UC-2) (with as much information as the DUE has available) to each Utility within the project limits; and request the following basic and estimated information from the Utility:

- Estimated Cost
- Estimated Design Time
- Estimated Construction Time
- Describe the type and amount of facilities your company has within the project limits. (number of poles, cables, pipes, conduit; sizes or voltages; etc.)
- Presence of any unique/special facilities or situations within the project which would require special attention. (Controlled Environmental Vaults, Sub-Stations, Transmission Towers, seasonal requirements, long lead times for outages, etc.)

The Utility Company shall provide the information regarding the Utilities' facilities, and any other additional information which may be relevant to the project, to the DUE within 40 business days.

The intent of the Potential Utility Impact Questionnaire (Form UC-2) is to gather only basic information from the Utility to assist the MDOT SHA in establishing realistic project delivery schedules and cost estimates. The Utility Company is only providing **potential** ballpark cost and time estimates to the best of their knowledge and ability; and it is understood that these estimates are not based on the accuracy obtained from fully designed plans. The Utility Company responses will be recorded on the Utility Status Report by the DUE and provided to the Statewide Utility Engineer and the Project Manager no later than 10 business days after receipt of the Utility Company's response.

8.05.02 Design Initiation (0%) to Preliminary Investigation (30%)

For a project to be successful, utility coordination must start concurrently with initiation of design as utility identification is the necessary foundation for future utility coordination.

8.05.02.01 Design Initiation (0% - 5%) Utility Investigation

All projects which propose disturbance with the potential to impact existing utility facilities must request utility designation through the Plats and Surveys Division, Utility Survey Supervisor (USS), concurrently with the topographic survey and the existing right-of-way mosaic or work map.

The Utility Designation may be completed through various methods. Regardless of the method chosen, it is imperative that it be initiated and completed concurrently with the project's topographic surveys. These methods are:

a) SUE – Consultant Performed

When the MDOT SHA can perform SUE work with Consultant Utility Investigation Contracts (SUE or Multi Service), the MDOT SHA performs QL-B Utility Designations, as the consultants are tasked with obtaining the As-Built Plans from the Utility Owners and performing a QA/QC review before submission. The USS initiates the utility identification by way of SUE Work based on the PM's request and is responsible for:

At Quality Level – B (QL-B):

- Generating a non-submitted MISS Utility Design Ticket to identify the Utility Owners in the Limits of Disturbance (LOD) of the projects and provides a copy of the list of identified the Utility Owners to the DUE.
- Assigning the task to a SUE Consultant Firm, through the Engineering Resource Division (ERD) process to obtain a .dgn utility designation (mUT-**D**000_) and As Builts.

- If there is not an absence of underground utilities and an "Absent of Utilities" letter is not submitted, the USS is responsible for reviewing the Deliverables and As Builts. Items for review are as follows: correct DATUM, Utility lines Z axes are at the elevation of the land, except for gravity sewer pipes; check for proper label and color identification; pipe/cable sizes; sewer inverts; and comparison against the topography surface features.

At Quality Level – A (QL-A):

- Reviewing the PM's UCM, Test Hole Boring Box file **.**dgn against the QL-B Designation. Eliminating any gravity sewer Test Holes where inverts are available and any MDOT SHA electric.
- Reviewing the Northing and Easting/Station and Offset targets.
- Assigning the task to a SUE Consultant Firm, through the ERD process.
- Reviewing the deliverables to confirm the Test Hole Boring Box file **.**dgn (mUT-**T**000_), and Test Hole Data Forms elevation findings stated on the Test Hole Data Forms are reflected on the Test Hole Boring Box file **.**dgn and the line work on the mUT-D000 file are revised to reflect the horizontal findings.

b) <u>SUE – MDOT SHA Performed</u>

If the MDOT SHA is without consultant resources to perform SUE work, the USS initiates the utility identification by way of submitting a MISS Utility Design Ticket.

At Quality Level – C (QL-C):

- Works with DUE to obtain Utility Owner As-Built Plans in the LOD of the projects.
- Confirms response from all utilities on the Miss Utility Design Ticket have responded.
- Seeks PSD Area Engineers availability to utilize Survey Contracts to survey the Miss Utility Marks.
- Assist with assigning the task to a Consultant Firm, through the ERD process.
- If there is not an absence of underground utilities and an "Absent of Utilities" letter is not submitted, the USS is responsible for reviewing the Deliverables and As-Built Plans. Items for review are as follows: correct DATUM, Utility lines Z axes are at the elevation of the land, except for gravity sewer pipes; check for proper label and color identification; pipe/cable sizes; sewer inverts; and comparison against the topography surface features.

c) <u>Aerial Facilities</u>

Upon notification of the Design Initiation of a project by the Project Manager, the DUE compiles a list of the aerial Utility Companies within the proposed project. The DUE, or designee, visits the proposed project and identifies two poles within the project limits, one pole owned by the electric company and a different pole (preferably on the opposite side of the roadway and/or at a different location within the project) owned by the telecommunication company. The DUE then submits a request to the electric company and the telecommunication company for the inventories of facility owners and/or lessees attached to the identified poles. The electric company and the telecommunication company shall send a list of the utilities that have facilities on their respective poles within 20 business days to the DUE. The DUE then compares and compiles a complete list of aerial facility Utility Companies.

8.05.02.02 District Utility Investigation

Upon completion of the request for the inventory of existing facility owners and/or lessees attached to poles owned by the electric and telecommunication Utility Companies; and receipt of the list of the identified underground Utility Owners from the Utility Survey Supervisor, the DUE will send the Potential Utility Impact Questionnaire (Form UC-2) requesting an update to utility information received during the Planning Phase (provided the Potential Utility Impact Questionnaire (Form UC-2) was sent and information received during the Planning Phase); to assist the MDOT SHA in establishing realistic project delivery schedules and cost estimates. With this information, the Project Development Team including the DUE will determine how much coordination will be needed for the project as per Section 8.01.02 - Risk Management Approach to Utility Coordination; and develop the initial project schedule and milestones.

8.05.02.03 Plan Development (5% - 25%)

Upon completion of the QL-B utility designation, base plan sheets showing existing utilities in color along with topographic features and existing right-of-way shall be provided to MDOT SHA's various design sections as directed by the Project Manager.

Plan Development shall include preliminary line/grade/typical section, concept drainage design (structures type, size, and location), preliminary stormwater management, preliminary traffic concepts as required for major structures (overhead, cantilever, signals, etc.), preliminary type, size and location for structures, (bridges, retaining walls, sound barriers, etc.), and preliminary right-of-way (R/W) needs. As part of this design, each design section of the project team shall identify potential utility impacts resulting from their respective concept design and evaluate avoidance and minimization options where prudent and feasible to meet the project's purpose and need while still providing safe conditions for all users.

8.05.02.04 Initial UCM Development (25% - 30%)

Plans shall be considered at PI stage when preliminary line/grade/typical section, concept drainage design (structures type, size, and location), preliminary stormwater management, preliminary traffic concepts as required for major structures (overhead, cantilever, signals, etc.), preliminary type, size and location for structures, (bridges, retaining walls, sound barriers, etc.), environmental (with any nearby sensitive resources identified), preliminary R/W needs and existing utilities (QL-B minimum) are shown on the plans.

Once the PI Plans have been completed, the Project Manager will conduct a Project PI meeting with MDOT SHA's Project Development Team and discuss the status of all project element updates. The Project Manager will develop an initial Utility Conflict Matrix (UCM) based on the PI Plans, the Utility Designation, and the Project PI meeting. With this information, the Project Development Team including the DUE will revise the project schedule and milestones along with the level of coordination required, if needed. Within 20 business days of the Project PI meeting, the Project Manager will revise the PI plans and send the DUE the following:

A) A cover letter with a written project scope to demonstrate the project's purpose and need,

B) Revised PI plans with utilities in color,

C) Pipe profiles,

D) An initial Utility Conflict Matrix.

These PI plans may be provided electronically or via hard copy. The DUE, the Project Manager, and necessary Designers, must meet to review the UCM and ensure that all potential conflicts are

recorded and addressed.

The Project Manager will coordinate with the DUE to determine the number of PI plan sets needed for transmittal to the utilities, PI plan sets needed with color coded utilities, and copies of the UCM. The DUE shall compile a list of all Utility Companies for both the aerial and underground facilities within the project. The list of Utility Companies shall be from the aerial inventories in Section 8.05.02.01 (c) – Aerial Facilities and from the list provided by the Utility Survey Supervisor in Section; 8.05.02.01 (b) SUE – MDOT SHA Performed; or Section 8.05.02.01 (a) – SUE Consultant Performed.

8.05.03 Preliminary Investigation (30%) to Semi-Final (65%)

8.05.03.01 Utility Preliminary Investigation Meeting Preparation

Within 15 business days after receiving the UCM's and PI Plan sets from the Project Manager, the DUE will set a date for a separate Utility Preliminary Investigation (UPI) Meeting with the Utility Companies; send the UPI Plan Packages to the Utility Companies; and request the Utility Company Project Manager to complete the Utility Analysis Report (Form UC-3) for submittal to the DUE at the UPI Meeting. Refer to the Utility Analysis Report (Form UC-3) for additional information.

The Utility Companies shall be provided a minimum of 20 business days and not more than 30 business days to review plans and prepare the requested information prior to the UPI Meeting. In addition, the date shall be coordinated with the Project Manager and include other Designers as needed.

The DUE will request the Utility Company Project Manager to be prepared to discuss the following items at the UPI Meeting:

- Verify that all existing facilities have been identified on the plan sheets and if not, provide any additional information which may be missing.
- Comment on utility impacts and the Utility Conflict Matrix.
- Needs for additional QL-B and/or QL-A utility information.
- Utility relocation estimated costs. These costs will be estimated at 100% MDOT SHA responsibility at this point. Final/actual costs will not be available until utility design is complete and prior rights have been completed.
- Schedules for work (design and construction) are required before the construction contract is issued Notice to Proceed and detailed timeframes for any concurrent work to be performed by the Utility Company after the MDOT SHA Notice to Proceed.
- Any request for the MDOT SHA to design utility relocations and/or include the utility relocations/construction in project.
- Identification of additional Right-of-Way which may be needed for the project to accommodate utility relocations.
- Concurrence in any MDOT SHA utility concept, if provided.
- Any advance work required to facilitate utility relocations which may require MDOT SHA assistance.
- Any permitting issues (MDE, Army Corps of Engineers, County, etc.) related to the utility relocations.

The UPI Plan Package the DUE sends to the Utility Companies will consist of the following items:

- PI Plans showing MDOT SHA's preliminary line/grade/typical section; environmental (natural, cultural/historic and community) resources shown in project area; concept designs for drainage, stormwater management, structures, traffic; and the Utility Designation.
- The initial Utility Conflict Matrix reviewed by the Project Manager and the DUE.

- Utility Analysis Report (Form UC-3)
- Copy of the Potential Utility Impact Questionnaire (Form UC-2) (if completed during Planning)
- Any other pertinent project information.

8.05.03.02 Utility Preliminary Investigation (UPI) Meeting

The UPI Meeting should consist of two parts; both a field and an office meeting. The first part of the UPI Meeting should be at a location where plans and other documents can be displayed and discussed in detail. At this part of the UPI, the following issues should be discussed:

- Potential impacts to utilities including the conflicts defined in the Utility Conflict Matrix.
- Evaluating alternatives that will resolve the conflicts, including relocation of the utility or re-design of the MDOT SHA facility, and any difficulties that may result from each option.
- Additional utility identification required for QL-B and/or QL-A which may be needed to both further determine impacts and complete utility design.
- Right-of-Way needs to accommodate any potential utility relocation.
  - If additional Right-of-Way is needed for the relocation, then it should be noted so the MDOT SHA can build a schedule to clear necessary Right-of-Way in time for utility relocations to be completed prior to the MDOT SHA construction Notice to Proceed.
- The strategy for utility relocations for the project:
  - Utility work to be completed prior to MDOT SHA's NTP.
  - Utility work to be completed concurrent with the project by the Utility Company.
  - Including the utility work into the MDOT SHA contract.
- The Utility Company would need to submit a letter to the DUE requesting inclusion of the utility work into MDOT SHA's contract.
- What party will be responsible for leading the design (MDOT SHA, consultant, or Utility Company)?
  - The need for a separate MDOT SHA Breakout contract.
- Advance work required for the project including utility relocations by the Utility Company and other work (such as clearing, grubbing, and tree trimming) needed to facilitate the relocations.
- Environmental permitting and approval issues raised by the environmental divisions within OED OHD and OPPE.
- Other permitting issues.
- The utility relocation schedules which should include:
  - The estimated time needed for design and for relocation of each utility.
  - The required sequence of all utility work prior to the MDOT SHA Construction's Notice to Proceed.
- Utility relocation concepts.
  - For projects where it is easily identifiable that major utility relocations will be part of the project and have major impact on project schedule, the MDOT SHA may complete utility relocation concepts as part of the PI. Projects of this nature may be urban interchanges with major utilities, major roadway widening, dualizations, etc.
  - The need for utility concepts at PI should be identified at Design Initiation with the Project Development Team and DUE. These concepts will be discussed with the Utility Companies for concurrence including Right-of-Way requirements at the Utility PI.

The second part of the UPI Meeting should be conducted in the field on the same day, weather permitting, where the Utilities and the MDOT SHA can walk the project, discuss specific relocation issues, and physically see specific problem areas which may not be apparent by just

reviewing plans in the office.

During the field meeting, the DUE and/or the Utilities shall complete the first portion (identifying existing utility facility locations) of the RW-57 form. The DUE and/or the Utilities shall complete RW-57 form as per Section 7.03.01 (C) in order to generate the Prior Rights Report in a timely manner.

After the UPI Meeting, the DUE will prepare a UPI Report which shall consist of: the UPI Meeting minutes; the Utility Analysis Reports (Form UC-3) provided by the Utility Companies; and any other information provided by the Utility Companies. The DUE will also prepare a Utility Issue Resolution Contact List from the Utility Analysis Reports (Form UC-3) provided by the Utility Companies. The DUE will distribute the UPI Report and the Utility Issue Resolution Contact List within 10 business days from the date of the UPI to all attendees to ensure all communications are understood correctly. The Utility Companies will have 15 business days to respond with any corrections if necessary as required. The DUE shall take the UPI Report with any revisions from the Utility Companies and provide it to the Statewide Utility Engineer, Project Manager and ADE-Project Development no later than 10 business days after receipt of the Utility Company's response.

8.05.03.03 Plan Development (30% - 65%)

A) General

Plats and Surveys will be drafting and issuing Right-of-Way Plats to allow the Right-of-Way Acquisition process to begin. It is important to note that the Utility Company, the DUE, the Project Manager, the District Right-of-Way Chief, and the Plat Engineer attend the Right-of-Way PI at this point to coordinate; and ensure any right-of-way needed for utility relocations can be addressed in a timely manner. Refer to Section 2.04.04 - Determining Utility Right-of-Way and/or Easement Needs and Section 2.04.05 - Acquiring Utility Right-of-Way and/or Easements for further guidance.

Once the Project Manager receives the UPI Report from the DUE, the Project Development Team including the DUE will determine how much coordination will be needed for the project as per Section 8.01.02 - Risk Management Approach to Utility Coordination; and the Project Manager will revise/finalize the project schedule and milestones considering: Right-of-Way acquisition; utility relocation; permitting requirements; and the anticipated construction sequence and duration. It is important to provide an integrated and optimized schedule which accommodates all project development phases. The DUE will issue a Notice to Proceed for design to the Utility Companies and request the Utilities to submit a concept relocation design within 30 business days. On complex projects or projects requiring potential extensive relocations, the utility may request additional time which may be considered on a case by case basis.

The MDOT SHA will complete further QL-B and/or request QL-A utility identifications (test holes) and provide the information to the Utility Companies once complete. The MDOT SHA will fully develop the maintenance of traffic, drainage, stormwater management, erosion and sediment control, final structures, traffic, and landscape plans along with any utility relocation plans being completed by the MDOT SHA. These designs will further consider utility avoidance and minimization options where prudent and feasible.

The DUE should schedule Utility Progress Meetings with the Utility Companies, the Project Manager, and the Project Development Team as needed to review and discuss any issues with

right-of-way, maintenance of traffic, drainage, stormwater management, erosion and sediment control, final structures, traffic, landscape plans, and the utility design. Some of these meetings may require multiple field visits to effectively develop resolutions. If the resolutions result in design changes in the plans, the Project Manager, the DUE, necessary Designers, and the Utilities should meet to collectively revise the UCM accordingly and ensure that all potential conflicts are recorded.

B) Utility 3rd Party Work

For utility work to be included in the MDOT SHA construction contract, typically the Utility Company will submit a letter to the DUE requesting to include the utility work into the MDOT SHA construction contract. This letter should be sent within 20 business days after the UPI Meeting. The DUE will prepare and send the Utility 3rd Party Work request to the Project Manager and the Statewide Utility Engineer for concurrence within 10 business days from the receipt of the Utility Company's letter. The Statewide Utility Engineer and the Project Manager shall reply in writing no later than 15 business days after receipt of the DUE's request. In the event both the Project Manager and the Statewide Utility Engineer concur with the DUE's submittal of the Utility's request, the "Request for Agreement/ MOU" and the "Agreements Checklist" will need to be completed and submitted to the Office of Procurement & Contract Management Agreements Team to initiate an agreement with the Utility Company. Refer to Form - Agreements Checklist for additional information.

If the Utility 3rd Party work is for a Utility Company or other non-governmental entity, the DUE will prepare and submit these documents to the Agreements Team. Refer to Section 7.09 - UTILITY 3RD PARTY WORK for additional guidance.

If the Utility 3rd Party work is for a municipality, local government, or other governmental entity, the Project Manager will prepare and submit these documents to the Agreements Team.

Frequently, municipalities, local governments, and other governmental entities will send requests for utility work to be included in the MDOT SHA construction contract to the Project Manager. This is generally done in conjunction with the addition of other work for the municipality, local government, or other governmental entity such as decorative street lighting, brick paver sidewalks, etc. In this situation the Project Manager will prepare and send a notification of the 3rd Party work inclusion to the DUE and the Statewide Utility Engineer within 10 business days from the receipt of the municipality, local government, or other governmental entity request. The Project Manager will prepare and submit, the "Request for Agreement/ MOU" and the "Agreements Checklist" to the Agreements Team.

8.05.04 Semi-Final (65%) to Final Review (90%)

8.05.04.01 Plan Development (65% - 70%)

At Semi-Final, the Project Manager will conduct a Project Semi-Final Review meeting with MDOT SHA's Project Development Team and discuss the status of all project element changes and updates. Within 20 business days of the Project Semi-Final Review meeting, the Project Manager will revise the SF plans and send the DUE the following:

A) A cover letter identifying the specific plan sheets which were revised/changed and detailing any plan revisions/changes affecting utilities,

B) Revised SF plans with utilities in color,

C) Pipe profiles,

D) Any test hole results (not previously sent to the DUE), and

E) An updated Utility Conflict Matrix.

If there are design changes in the plans, the Project Manager, the DUE, necessary Designers, and the Utilities should meet to collectively revise the UCM accordingly and ensure that all potential conflicts are recorded and addressed.

It should be noted that any significant changes the MDOT SHA makes in the plan design, from this point forward, may result in utility redesign starting over. As a result, the utility design and project delivery schedules will be affected respectively. If there are any significant project scheduling and design changes that affect the Project Schedule, the issue(s) should be escalated as per the Utility Issue Resolution Flowchart so issue(s) are evaluated & resolved by the appropriate decision makers.

8.05.04.02 Utility Semi-Final Coordination Meeting Preparation

Within 15 business days after receiving the UCM's and SF Plan sets from the Project Manager, the DUE will set a date for a Utility Semi-Final (USF) Coordination Meeting with the Utility Companies if required; send the USF Plan Package to the Utility Companies; request the Utility Company Project Manager to update the Utility Analysis Report (Form UC-3) for submittal to the DUE at the USF Coordination Meeting. Refer to Form - Utility Analysis Report (Form UC-3) for additional information.

The Utility Companies shall be provided a minimum of 20 business days and not more than 30 business days to review plans and prepare the requested information prior to the USF Meeting. In addition, the date shall be coordinated with the Project Manager and include other Designers as needed.

The DUE will request the Utility Company Project Manager to be prepared to provide updates and current status on all the items discussed at the UPI Meeting. Refer to Section 8.05.03.01 - Utility Preliminary Investigation Meeting Preparation for items discussed at the UPI Meeting.

The USF Plan Package the DUE sends to the Utility Companies will consist of the following items:

- SF Plans showing MDOT SHA's line/grade/typical section; environmental (natural, cultural/historic and community) resources shown in project area; drainage designs, stormwater management design, structures, traffic; and the (QL-B/QL-A) Utility Designation.
- The updated Utility Conflict Matrix.
- A copy of the initial Utility Analysis Report (Form UC-3) (the Utility Company provided at the UPI Meeting).
- A Utility Analysis Report (Form UC-3) to be completed by the Utility Company with the current utility information for the USF Coordination Meeting.
- Any other pertinent project information.

8.05.04.03 Utility Semi-Final Coordination Meeting

The USF Coordination Meeting should consist of an update of all the information presented at the UPI Meeting. Specifically, the following items should be discussed:

- Utility conflicts identified in the revised Utility Conflict Matrix.
- Conflict resolutions, including any specific difficulties encountered or additional test holes needed.
- The utility relocation schedules including how much time is needed for design (plan submittal and PS&E submittal) and relocation of each utility and the sequence of any utility work required prior to the MDOT SHA's construction Notice to Proceed.
- Any outstanding right-of-way issues.

- Any outstanding environmental issues (natural, cultural, historic {agreements on how historic resources are to be treated}, community, stormwater, erosion and sediment control approvals, etc.).

At the USF Coordination Meeting, the DUE should direct the Utility Company to complete utility relocation design (the MDOT SHA's 65% semi-final plans should have been reviewed by all team members and any modifications required should have been completed and provided to the Utility Company). After the USF Coordination Meeting, the DUE shall prepare a USF Coordination Meeting Report which shall consist of the updated Utility Analysis Reports (Form UC-3) from the Utility Companies and the USF Coordination Meeting minutes. The DUE will distribute the USF Coordination Meeting Report within 10 business days from the date of the USF Coordination Meeting to all attendees to ensure all communications are understood correctly. The Utility

Companies will have 15 business days to respond with any corrections. The DUE shall take the USF Coordination Meeting Report with any revisions from the Utility Companies and provide it to the Statewide Utility Engineer, Project Manager, and ADE- Project Development no later than 10 business days after receipt of the Utility Company's response.

If there are any significant outstanding issue(s) which may affect the Project Schedule, the issue(s) should be escalated as per the Utility Issue Resolution Flowchart.

8.05.04.04 Plan Development (70% - 90%)

A) General

The Utility Company will provide final plans for the utility relocations to the DUE for the MDOT SHA to review and comment as mutually agreed to by the Project Manager, the DUE, and the Utility Company at the USF Coordination Meeting.

It should be noted again that any significant changes the MDOT SHA makes in the plan design, from this point forward, may result in utility redesign starting over. As a result, the utility design and construction schedules will be affected respectively. If there are any significant project scheduling and design changes that affect the Project Schedule, the issue(s) should be escalated as per the Utility Issue Resolution Flowchart so issue(s) are evaluated & resolved by the appropriate decision makers.

The DUE should schedule Utility Progress Meetings with the Utility Companies, the Project Manager, and the Project Development Team as needed to review and discuss any issues resulting from any revisions with right-of-way, maintenance of traffic, drainage, stormwater management, erosion and sediment control, final structures, traffic, landscape plans, and the utility design. Some of these meetings may require multiple field visits to effectively develop resolutions. If there are design changes in the plans, the Project Manager, the DUE, necessary Designers, and the Utilities should meet to collectively revise the UCM accordingly and ensure that all potential conflicts are recorded. With the revision of the UCM, test holes may be required to verify an actual conflict.

At this phase, the Right-of-Way Acquisition process is substantially underway. It is important that the Utility Company, the DUE, the Project Manager, the District Right-of-Way Chief, and the Plat Engineer meet to coordinate and ensure any right-of-way needed for utility relocations is being addressed to allow sufficient time for the Utilities to begin and complete their relocation work in order to meet MDOT SHA's project schedule.

Once comments from the MDOT SHA have been addressed, the Utility Company will submit its Plans, Specifications, and Estimate (PS&E) package to the DUE who will process and

forward the PS&E package to the Statewide Utility Engineer's staff for review (and, if required, preparation and submittal for federal aid). Refer to Section 7.07.02 - Utility Plans, Specifications, Estimates Package for additional guidance. The Utility Relocation PS&E Package should be submitted to the Statewide Utility Engineer's staff so that there is adequate time for the Statewide Utility Engineer's staff to process the Utility Relocation PS&E Package; and for the Utilities to begin and complete their relocation work prior to the MDOT SHA NTP date. Refer to Section 7.07 - UTILITY PERFORMED RELOCATIONS for additional guidance.

The Utility owner must provide their utility relocation designs, specifications, and the Utility Relocation PS&E package a minimum of three months prior to the MDOT SHA Advertisement Date so that the DUE can effectively prepare the SECTION 875 - Utility Statement for the contract documents. The DUE will complete the SECTION 875 - Utility Statement and submit to the Project Manager for inclusion in MDOT SHA's Final Review package. Refer to Section 7.10 - UTILITY SPECIAL PROVISIONS for additional guidance.

The Utility Company will confirm the utility relocation schedule with the District Utility Engineer including the estimated calendar date for utility clearance. This will be forwarded to both the Statewide Utility Engineer and the Project Manager. In coordination with the Project Manager, all necessary PS&E activities will be completed which are required for the Utility Company to begin the relocations. The PS&E activities include certification of Right-of-Way and verification that the project is funded for utilities. Once the Statewide Utility Engineer's staff has completed processing and approving the Utility Relocation PS&E Package, the Statewide Utility Engineer's staff will send the Form UC-7B to the DUE. The DUE will issue the Notice to Proceed for construction to the Utility Company once the Form UC-7B has been received from the Statewide Utility Engineer's staff. Refer to Form UC-7B for additional information.

The Utility Company will then start relocation work. The DUE will assign personnel to inspect work done by Utility or if the project requires significant inspection resources the DUE will request the District Engineer to assign personnel to inspect work done by Utility as per Construction Directive 07220.800.01. The DUE will hold regular Utility Status Meetings as needed and monitor progress of the relocations. Any delays incurred need to be communicated immediately to the DUE who would then forward the information to the Project Manager to determine how the delays impact the MDOT SHA project schedule.

B) Utility 3rd Party Work

For work to be included in the MDOT SHA construction contract and designed by the Utility Company, the Utility Company shall provide its 3rd Party Work PS&E to the DUE and the Project Manager to be incorporated into the MDOT SHA Final Review package and the signed (by the Utility Company) agreement or MOU to the Office of Procurement & Contract Management Agreements Team for execution by the MDOT SHA. The Office of Procurement & Contract Management Agreements Team will forward a copy of the executed agreement to the Statewide Utility Engineer. Refer to Section 7.09.03 - Utility 3rd Party Work Plans, Special Provisions & Estimate Package and Section 7.09.03.04 - Utility 3rd Party Work Agreements for additional guidance.

The DUE or Project Manager (depending on who initiated the Agreement Process with the Agreements Team) will forward a copy of the utility plans to the Statewide Utility Engineer for processing. The Project Manager will forward a copy of the utility items incorporated into

MDOT SHA's project from Trns*Port to the Statewide Utility Engineer. The Statewide Utility Engineer's staff will determine the cost responsibility and verify the quantity of each utility item in the estimate and prepare the Forms UC-10 & UC-11; then submit this information to the Project Manager to revise, if necessary, the items in Trns*Port; and to the Office of Finance – Accounts Receivable for the contract estimate billing. Refer to Forms UC-10 & UC-11 for additional information.

The DUE and the Project Manager will jointly review the Utility Specific Special Provisions, Sections 876 thru 881 to ensure the Utility Special Provisions contains the utility standards and specifications needed by the contractor to properly construct, adjust, relocate and/or remove the utility facilities for the MDOT SHA project; and do not conflict with any other MDOT SHA Special Provision for the MDOT SHA project. Refer to Section 7.10.02 - Utility Specific Special Provisions for additional guidance.

The DUE will complete the SECTION 875 - Utility Statement and submit to the Project Manager for inclusion in MDOT SHA's Final Review package. Refer to Section 7.10 - UTILITY SPECIAL PROVISIONS for additional guidance.

8.05.05 Final Review (90%) to Plan, Specifications & Estimate (100%)

8.05.05.01 Plan Development (90% - 95%)

Once the MDOT SHA's Final Review package has been completed, the Project Manager will conduct a Project Final Review meeting with the MDOT SHA's Project Development Team and discuss status of all project element changes and updates. Within 20 business days of the Project Final Review meeting, the Project Manager will revise the FR plans and send the following:

A) A cover letter identifying the specific plan sheets which were revised/changed and detailing any plan revisions/changes affecting utilities,

B) Revised FR plans with utilities in color,

C) Pipe profiles,

D) Any test hole results (not previously sent to the DUE), and

E) An updated Utility Conflict Matrix.

If there are design changes in the plans, the Project Manager, the DUE, necessary Designers, and the Utilities should meet to collectively revise the UCM accordingly and ensure that all potential conflicts are recorded and addressed.

Any significant changes the MDOT SHA makes in the plan design at this point forward will result in utility redesign starting over. As a result, the utility design and construction schedules will be affected respectively. If there are any significant project scheduling and design changes that affect the Project Schedule, the issue(s) should be escalated as per the Utility Issue Resolution Flowchart so issue(s) are evaluated & resolved by the appropriate decision makers.

8.05.05.02 Utility Final Review Coordination Meeting Preparation

Within 15 business days after receiving the UCM's and FR Plan sets from the Project Manager, the DUE will set a date for a Utility Final Review (UFR) Coordination Meeting with the Utility Companies if required; send an UFR Plan Package to the Utility Companies; and request the Utility Company Project Manager to update the Utility Analysis Report (Form UC-3) for submittal to the DUE at the UFR Coordination Meeting. Refer to Form - Utility Analysis Report (Form UC-3) for additional information.

The Utility Companies shall be provided a minimum of 20 business days and not more than 30 business days to review plans and prepare the requested information prior to the UFR Meeting. In addition, the date shall be coordinated with the Project Manager and include other Designers as needed.

The DUE will request the Utility Company Project Manager to be prepared to provide updates and current status on all the items discussed at the UPI and USF Coordination Meetings. Refer to Section 8.05.03.01 - Utility Preliminary Investigation Meeting Preparation for items discussed at the UPI Meeting.

The DUE will send a UFR Plan Package to the Utility Companies which will consist of the following items:

- FR Plans showing MDOT SHA's final designs for line/grade/typical section, drainage design, stormwater management design, structures, traffic; environmental (natural, cultural/historic and community) resources shown in project area; and the (QL-B/QL-A) Utility Designation.
- The updated Utility Conflict Matrix.
- A copy of the initial Utility Analysis Report (Form UC-3) (the Utility Company provided at the USF Coordination Meeting).
- A Utility Analysis Report (Form UC-3) to be completed by the Utility Company with the current utility information for the UFR Coordination Meeting.
- Any other pertinent project information.

8.05.05.03 Utility Final Review Coordination Meeting

The UFR Coordination Meeting should consist of an update all of the information presented at the USF Coordination Meeting. Specifically, the following items should be discussed:

- Utility Companies shall provide updated schedules to the DUE for utility work to be completed prior to the MDOT SHA's Notice to Proceed in order for the DUE to revise the Utility Statement Special Provisions if necessary.
  - CADD files should be sent to the SHA Project Manager if available.
- Utility conflicts identified in the revised Utility Conflict Matrix.
- Any outstanding issues.

At the UFR Coordination Meeting, the Project Manager, the DUE, and the Utility Companies should be primarily focused on the utility relocation status. By the Final Review stage, relocation strategies should have been developed and major issues resolved. If there are any significant outstanding issues which may affect the Project Schedule, the outstanding issue should be escalated as per the Utility Issue Resolution Flowchart.

After the UFR Coordination Meeting, the DUE shall prepare a UFR Coordination Meeting Report which shall comprise of the updated Utility Analysis Reports (Form UC-3) from the Utility Companies and the UFR Coordination Meeting minutes. The DUE will distribute the UFR Coordination Meeting Report within 10 business days from the date of the UFR Coordination Meeting to all attendees to ensure all communications are understood correctly. The Utility Companies will have 15 business days to respond with any corrections. The DUE shall take the UFR Coordination Meeting Report with any revisions from the Utility Companies and provide it to the Statewide Utility Engineer, the Project Manager and the ADE- Project Development no later than 10 business days after receipt of the Utility Company's response.

8.05.05.04 PS&E Plan Development (95% - 100%)

The Project Manager will complete final plans, specifications and estimates for constructability and technical reviews; Environmental and Highway Design PS&E submittals.

It should be noted that any significant changes the MDOT SHA makes in the plan design, from this point forward, will result in utility redesign starting over. As a result, the MDOT SHA's construction schedules will be impacted. If there are any significant project scheduling and design changes that affect the Project Schedule, the issue(s) should be escalated as per the Utility Issue Resolution Flowchart so issue(s) are evaluated & resolved by the appropriate decision makers.

The MDOT SHA Project Manager will then handle all the final necessary PS&E activities to advertise for bid the MDOT SHA Construction Contract.

8.05.05.05 Utility Relocation Activities Prior to MDOT SHA's Advertisement

The DUE shall continue to monitor progress of the relocations. Maintaining the schedule of the phased relocations is imperative to the MDOT SHA Contract's success. Any delays or issues incurred by the Utility Company need to be communicated immediately by the DUE for issue resolution. The DUE needs to notify the Design Project Manager and the Assistant District Engineer for Construction of any relocation delays that may impact the schedule of the MDOT SHA contract.

8.05.06 Advertisement to MDOT SHA Construction Notice to Proceed

Utility Companies shall provide updated schedules to the DUE for utility work to be performed prior to the MDOT SHA's Notice to Proceed. This shall be provided to the ADE - Construction and the Project Manager. The ADE - Construction coordinates the MDOT SHA Construction the Notice to Proceed (NTP) date with the Office of Construction to verify all necessary utility relocations will be complete to allow the MDOT SHA construction contract to begin. If the utility relocations will not be completed prior to the NTP, it is imperative the ADE - Construction and the MDOT SHA Office of Construction work closely with the DUE and the Utilities to ensure utility relocation activities are coordinated with the MDOT SHA's construction prior to the issuance of the NTP. If MDOT SHA's construction Notice to Proceed is issued prior to the completion of the utility relocation work, the contractor may file a delay claim to the MDOT SHA. As the Federal Highway Administration may not participate in delay costs associated with utility relocations, the Utility shall be responsible for claims against the MDOT SHA if those claims were costs incurred by MDOT SHA's Contractor which were caused by or which grew out of the failure of the Utility to carry out and complete its work in a timely and reasonable manner. Refer to Section 7.11.02 Delay Claims for additional information.

8.05.07 MDOT SHA Construction Phase

The DUE shall continue to monitor all utility relocation work which may overlap and/or be concurrent with the MDOT SHA Construction Contract. Once the project is in construction, the Project Engineer will assign inspection personnel to inspect work done by Utility as per Construction Directive 07220.800.01. In this case, an inspector may be assigned to their activities, but with their primary duty being daily visits to utility work site. If the utility relocation work will overlap and/or be concurrent with the MDOT SHA Construction Contract, the Project Manager, the DUE, necessary Designers, the MDOT SHA Construction Project Engineer, the Area Engineer, the Assistant District Engineer for Construction, and the Utilities should meet to collectively revise the UCM accordingly and ensure that all potential conflicts are recorded.

Utility relocation information should be provided to the MDOT SHA Construction Project Engineer, the Area Engineer, and the Assistant District Engineer for Construction. The Utility Companies, either performing concurrent work or included in the contract, shall be invited and involved in the MDOT SHA progress and partnering meetings. The DUE shall attend and be involved in the MDOT SHA progress and partnering meetings until the utility relocation work is complete. The Utility Company clearance dates shall be included and tracked in the Contractor's Schedule and updated as part of regular schedule updates. Any issues identified shall be escalated using the Utility Issue Resolution Flowchart and the Utility Issue Resolution Contact List for resolution to assure the MDOT SHA Construction Contract remains on schedule.

In the event during construction a Change Order is required relative to utility work, the Project Engineer, the Utility and the DUE shall follow the process as per Construction Directive 07220.100.23.

8.06 MDOT SHA PROJECT UTILITY ISSUE RESOLUTION CHAIN

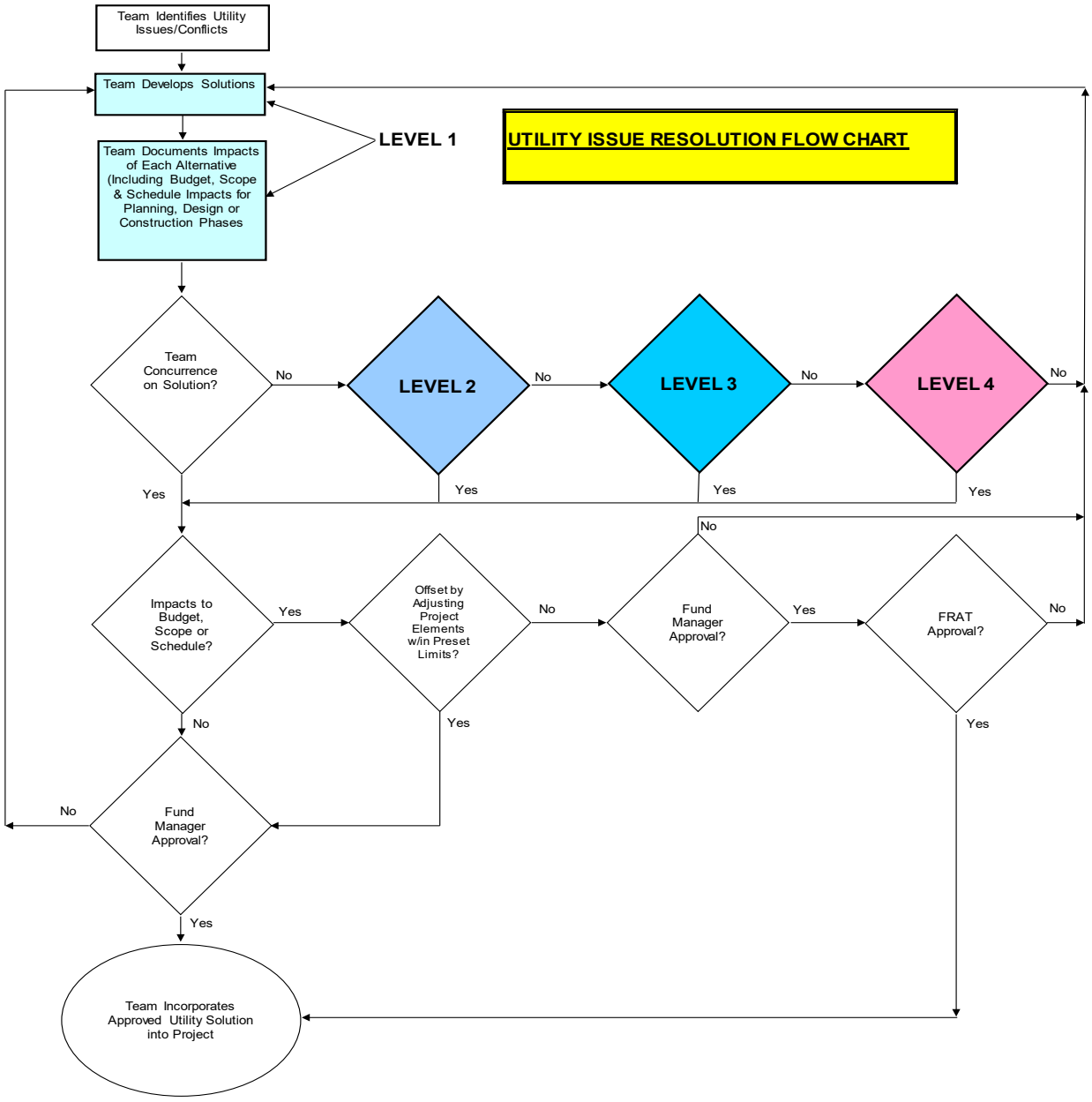
Issue resolution is a key element in the success of a project. Issues must be identified, communicated in a timely and effective manner. This means that issues must be evaluated & resolved by the appropriate decision makers. Team members must be aware that issues may affect scope, schedule, and budget may require review and approval at higher levels, including senior management. Two tools have been developed to assist in resolving issues:

- Utility Issue Resolution Flow Chart
- Utility Issue Resolution Contact List

The Utility issue resolution flow chart can assist the Project Team by providing a map to the development of solutions.

The Issue Resolution Contact List should be utilized to organize and maintain the contacts of the different entities involved in utility coordination on any project. At the start of each project the DUE will create this contact list populated for all levels of issue resolution to ensure proper coordination between the stakeholders.

8.06.01 Utility Issue Resolution Flow Chart



8.06.02 Utility Issue Resolution Contact List

UTILITY ISSUE RESOLUTION CONTACT LIST				
	LEVEL 1	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**
Design Lead	Project Manager/Team Leader	Division Chief or ADC	Director or Deputy Director	DA/CE for Planning, Engineering, Real Estate and Env.
District Utilities	District Utility Engineer	ADE Project Development	District Engineer or Deputy District Engineer	DA/CE for Operations
District Construction	Area Engineer	ADE Construction	District Engineer or Deputy District Engineer	DA/CE for Operations
Office of Construction (OOC) - Utilities	Areawide Utility Engineer	Statewide Utility Engineer	Director or Deputy Director	DA/CE for Operations
Telephone Company	Engineer	Manager	Director	Senior Executive or CEO
Electric Company	Engineer	Manager	Director	Senior Executive or CEO
Cable Company	Engineer	Manager	Director	Senior Executive or CEO
Gas Company	Engineer	Manager	Director	Senior Executive or CEO
County DPW or Water/Sewer Responsibility center	Engineer	Manager	Director or Deputy Director	County Executive or CEO

CHAPTER 9

BRIDGES

AND

OTHER STRUCTURES

9.01 GENERAL

A) Installations on or near any of the following (which are defined as Highway Structures) shall require review and written approval by MDOT SHA's Office of Structures (OOS) unless otherwise specifically identified differently in this Chapter prior to any permit being issued by the appropriate District Engineer or their approved designee or project approval by the Project Engineer:

- **Bridges**
- **Approach slabs**
- **Retaining walls**
- **Noise walls**
- **Tunnels**
- **Box culverts**
- **Pipe arches**
- **Pipes Greater Than 3' Diameter**

B) Requests to install facilities near or attach facilities to a structure shall be submitted, in writing, to the appropriate District Engineer or their approved designee unless otherwise directed by the appropriate District Engineer or their approved designee. See Section 9.07 - STRUCTURES REVIEW PROCESS for further guidance.

C) Compliance with the installation or attachment requirements of this CHAPTER 9 – BRIDGES AND OTHER STRUCTURES does not constitute automatic approval for said installation or attachment.

D) Any permit, project approval or OOS approval allowing a Utility or Permittee to install facilities near any or attach to any highway structure does not constitute any permanent right for such installation or attachment. Any removal, rehabilitation, maintenance, or relocation of the installation or attachment, whether required by MDOT SHA or not, shall be promptly accomplished by the Utility or Permittee at no cost to the MDOT SHA.

E) Installations or attachments that deviate from the preapproved submittal requests without prior approval from the OOS shall be subject to removal at no cost to the MDOT SHA.

F) Provisions for a utility attachment may be included during the design of a structure. See Section 9.06 - STRUCTURES PROJECT COORDINATION for further guidance.

G) Utility and Permittee facilities, when permitted, are to be installed, serviced, and maintained without access from the bridge deck.

H) In all cases, the utility or Permittee is responsible for restoration and repair of damage to the structure and/or the highway as a result of the construction, maintenance, and/or operation of the utility or facility.

9.02 GUIDANCE DOCUMENTS for HIGHWAY STRUCTURES

A) Any utility work in connection with Highway Structures shall be in complete conformance with specifications, standards, provisions and policies of Section 1.08 - GENERAL GUIDANCE DOCUMENTS.

B) In addition to the documents referenced in the previous paragraph, design and construction associated with Highway Structures shall be performed in complete conformance with, and particular attention to, the most recent version of the following publications as applicable to the type of utility facility and/or type of work:

- Book of Standards For Highway & Incidental Structures
- Office Of Structures General Notes

- Standard Specifications For Construction And Materials
- Structural Standards and Details
- Supplemental Specifications and Provisions
- AASHTO Technical Manual for Design and Construction of Road Tunnels – Civil Elements
- AASHTO LRFD Movable Highway Bridge Design Specifications
- COMAR - Title 20 Public Service Commission, Subtitle 55 SERVICE SUPPLIED BY GAS COMPANIES
- DOT PHMSA Pipeline Safety Regulations Part 192

C) Whenever MDOT SHA's Standard Specifications For Construction And Materials is referred to in this Chapter or this Utility Manual, the latest version of the Supplemental Specifications and Provisions shall be reviewed to ensure the most current specification is used.

9.03 AERIAL INSTALLATIONS NEAR STRUCTURES

A) For bridge rehabilitation, maintenance and inspection purposes, aerial utility crossings should not be placed underneath the deck and superstructure of any structure. Installations of aerial utility facilities proposing to cross underneath any structure shall submit a request for review and approval by both the OOS and the appropriate District Engineer or their approved designee.

1. All requests for these installations shall be made to the appropriate District Engineer unless otherwise directed by the appropriate District Engineer.

2. Approval for these installations shall be from the appropriate District Engineer or their approved designee via the Utility Permit.

B) Proposed installations of aerial utility facilities longitudinally to a structure of a controlled access right-of-way highway are prohibited.

C) Aerial utility facilities placed longitudinally to a structure of a non-controlled access highway crossing over controlled access rights-of-way; aerial utility facilities placed longitudinally to a structure within non-controlled access rights-of-way; and aerial utility crossings over structures may be allowed at the discretion of the appropriate District Engineer or their approved designee. (See Section 6.03 - FULLY CONTROLLED ACCESS ROADWAYS, Section 6.04 - PARTIALLY CONTROLLED ACCESS ROADWAYS, and Section 6.05 – NON-CONTROLLED ACCESS ROADWAYS for further guidance.)

1. Installations shall be installed to accommodate bridge maintenance and inspection operations; and to the extent possible, future bridge rehabilitation.

2. Approval for these installations shall be from the appropriate District Engineer or their approved designee via the Utility Permit.

D) Aerial installations shall comply with all other sections and requirements of this Utility Manual including, but not limited to, CHAPTER 4 - UTILITY CONSTRUCTION and Section 6.11 - VERTICAL CLEARANCES.

9.04 UNDERGROUND INSTALLATIONS NEAR STRUCTURES

A) Installations of underground utility facilities within 100 feet of any structure shall submit a request for review and approval for both the OOS and the appropriate District Engineer or their approved designee.

1. All requests for these installations shall be made to the appropriate District Engineer unless otherwise directed by the appropriate District Engineer.
2. Approval for these installations shall be from the appropriate District Engineer or their approved designee via the Utility Permit unless work is Utility 3rd Party Work incorporated into MDOT SHA's construction project.

B) All underground installations near structures, when permitted, shall meet the following requirements:

1. Installations shall be above footings, seals, or pile groups.
2. Installations shall be outside the 45-degree Zone of Influence from the bottom of any edge of a structures footing or foundation. Figure 9.04-1 – Bridge Structure Zone of Influence, illustrates these limits.

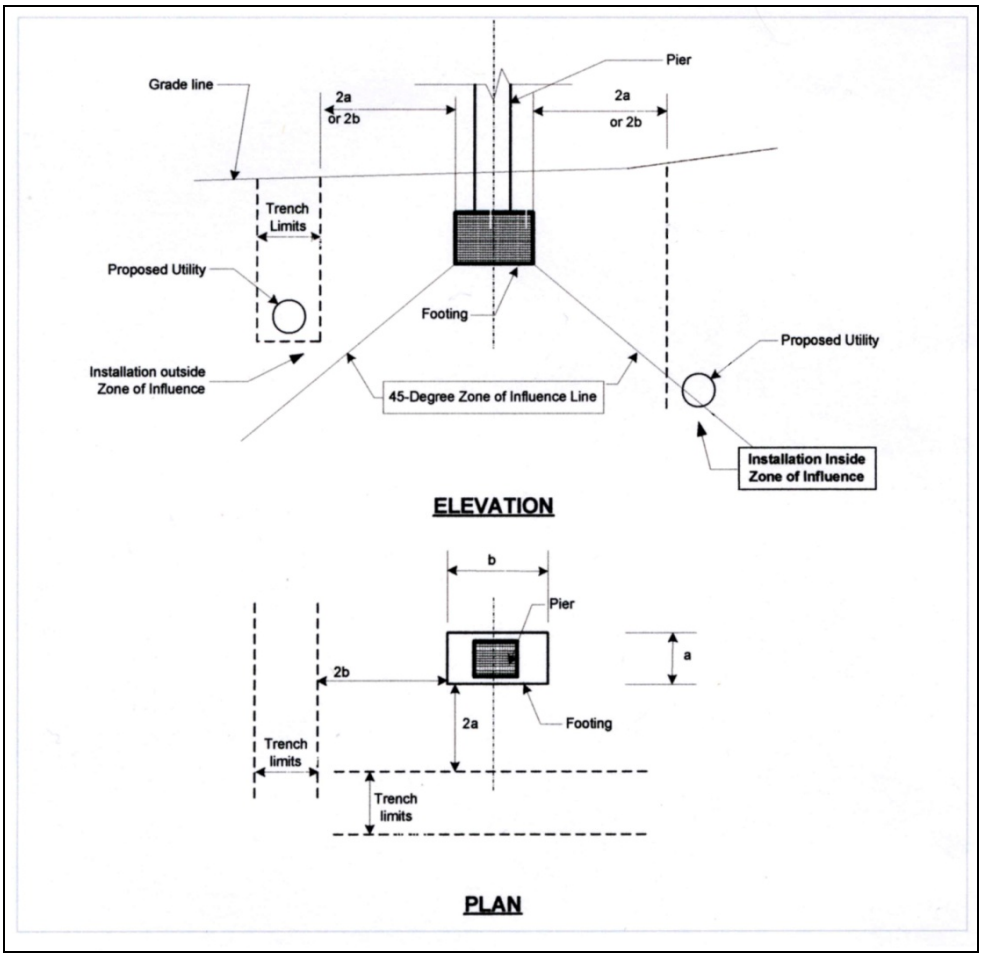


Figure 9.04-1 – Bridge Structure Zone of Influence

3. The proposed method of installation shall not, in any way, be detrimental to the structure or foundation.
4. Carrier pipes of all pressurized utilities shall be pressure tested before start-up in accordance with the latest edition of applicable industry codes, or appropriate regulations of an agency of the federal government.

5. Pressurized utilities shall be sleeved to minimize undermining of the substructure in the event of damage or rupture to the carrier pipe. Casing pipes are to be designed to accommodate all externally applied loads. (See Section 6.08 - Sleeves and Casings, for further guidance.)

a) Underground gas lines near Structures

i. Where casings are required, the casing pipes are to extend for the full width of the right-of-way and/or sufficiently beyond the structure foundation/footings, as determined by OOS, so that the transmittants from a broken carrier pipe will be safely discharged away from the footing.

ii. The casing pipe is to be sealed to the carrier pipe at each end.

b) Underground pressurized liquid (water, sewer force mains, etc.) near Structures

i. Casing pipes are to extend for the full width of the right-of-way and/or sufficiently beyond the structure foundation/footings, as determined by OOS, so that the transmittants from a broken carrier pipe will be safely discharged away from the footing.

ii. The casing pipe shall be sealed to the carrier pipe at the high end and open into a man-hole at the low end. The casing may be either steel or reinforced concrete, and shall be designed for all externally applied loads and for the internal pressure from a ruptured carrier pipe. A shut-off valve is to be installed on the pressure side of the right-of-way.

9.05 ATTACHMENTS TO HIGHWAY STRUCTURES

A) Attaching utility lines to a highway structure can materially affect the integrity and appearance of the structure, the safe operation of traffic, future modifications, and the efficiency of maintenance. Therefore, the MDOT SHA has adopted a general requirement of discouraging attachments to bridge structures except where there is no other feasible and reasonable place to locate utility lines. Where it is feasible and reasonable to locate utility lines elsewhere, attachments to highway structures will not be permitted.

1. Attachments to historic structures is strictly prohibited.

B) Gas lines with diameters which would affect the integrity of any of the structural elements of a highway structure (stiffeners, diaphragms, beams, etc.); and pipelines carrying explosive, corrosive or flammable fluids will not be permitted to be installed on highway structures.

C) Electrical lines with voltage in excess of 98 kilovolts rms to ground shall not be installed on structures.

D) However, where other locations prove to be difficult, unsafe and/or unreasonably costly, consideration may be given for attaching a utility to a highway structure and only when all of the following conditions exist:

1. No other practicable alternative is available, including private easement

2. The attachment will not create a hazard to the public

3. The public interest will suffer if approval is not granted

4. The structural integrity of the structure will not be threatened by the attachment

5. None of MDOT SHA's basic interests will be substantially compromised by the attachment, including reasonable ease of bridge inspection and maintenance.

E) Since highway structure designs and site conditions vary, the adoption of standardized methods to accommodate utility facilities on structures is not feasible. Each proposed bridge attachment will be considered on its individual merits and shall be separately designed.

F) Attachments to concrete structures, if permitted, must conform to the general structural, aesthetic and other specific requirements as for steel structures but the details thereof shall be determined on a case by case basis and tailored to the particular concrete structure.

9.05.01 General Requirements

In addition to the specific requirements that concern communication systems and specific guidelines for pipelines which are presented in subsequent adjacent subsections, the following are examples of requirements generally applicable to utility attachments:

A) Where appreciable live or dead loads (not provided for in the original design) are to be added to an MDOT SHA structure, stress calculations signed and sealed by a professional engineer registered in Maryland must show that the structure can safely withstand the additional stress which shall include the following considerations:

1. Utility supports shall be designed such that any loads imposed by the utility installation do not overstress the conduit, the supports, or the bridge members.
2. All utilities and utility supports shall be designed not only to support their dead load but also to resist other forces from the utility, such as surges, wind, or earthquakes. The Utility Company may be asked to submit one set of calculations to verify utility design forces.
3. Utility locations and supports shall be designed so that a failure, such as a rupture, will not result in damage to the bridge or the surrounding area, nor become a hazard to traffic.

B) Utility facilities are to be designed in accordance with all governing codes.

C) All utility installations will be isolated and insulated from the structure to avoid causing corrosion

D) No utility facilities will be allowed in a location where they would be vulnerable to damage or rupture by a traffic accident and thus create a traffic hazard

E) Any changes in the transmittant or pressure beyond that reviewed and approved in the original installation must be subjected to an additional review process for approval from MDOT SHA.

F) Where similar, competing utilities (for example, telecommunication companies) desire attachment to a structure, the MDOT SHA normally requires that they consolidate facilities to jointly share use of conduits, ducts or sleeves in order to minimize the impact to MDOT SHA's structure. Joint use requires advanced planning and coordination on the part of the utilities.

G) Acceptable utility attachment methods are hangers and/or roller assemblies supported by diaphragms between the exterior and first interior stringers.

H) No part of the Utility's facility installation (carrier pipe, brackets, hangers, etc.) may project below the bottom flange of the highest adjacent stringer.

1. Refer to Figure 9.05.01 – Facilities Next to Highest Adjacent Stringer for additional guidance.

2. To comply with the requirement, it may be necessary to raise or replace existing diaphragms with smaller diaphragms, and to place additional diaphragms as necessary to support the installation and to equal the strength of the diaphragms removed.

   a) Removal and replacement shall be carried out progressively.

   b) All connections shall be bolted.

      i. Welded connections shall not be permitted.

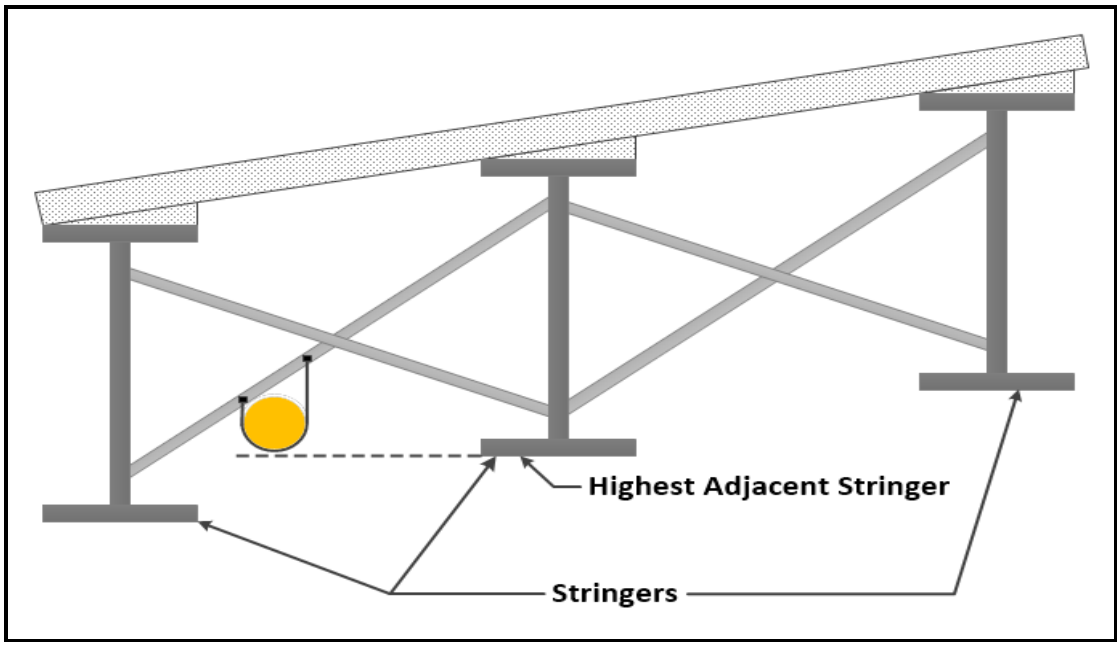


Figure 9.05.01 – Facilities Next to Highest Adjacent Stringer

I) On site drilling of bridge concrete or welding to existing steel shall not be allowed.

J) The design of a utility facility attached to a highway structure must include provisions for the lineal expansion and contraction of the facility, due to temperature differentials. The attachment must be independent of, and compatible with, the expansion and contraction design of the bridge. The attachment must be adequately supported and prevent other longitudinal forces from being transferred to bridge members. Bridge structures shall not be used as thrust blocks for utility facilities under pressure. Concrete buttresses are to be placed as appropriate at each end of the structure.

K) Manholes, handholes, or similar utility elements shall not be installed in the bridge deck on overcrossings.

9.05.02 Aesthetics

A) Utility facilities attached to the outside of bridges are unsightly and susceptible to damage.

   1. Utilities shall not be attached above the bridge deck or to railing or rail posts.

   2. Utility facilities attached to structures shall be hidden from public view.

B) Utility facility mountings are to be of a type which will not rattle due to vibrations caused by traffic. The support rollers, saddles or hangers shall be coated or padded with neoprene or otherwise equipped to muffle vibration noise and minimize wear.

C) All utilities and utility support surfaces, including any galvanized utilities, shall be painted in accordance with Section 9.02 - GUIDANCE DOCUMENTS for HIGHWAY STRUCTURES and as approved by OOS. The final coat shall match the color of the bridge or structure.

D) Coating systems for Utilities must be compatible with the life expectancy of coating systems of bridge members.

1. All painted surfaces damaged during construction shall be cleaned and painted as noted above.

2. Any and all paint splatters and overspray shall be removed from the structure to the satisfaction of MDOT SHA.

9.05.03 Clearances

A) Utility facilities attached to bridge structures shall maintain a vertical clearance at least equal to that of the structure at any point. Entire installation including supporting brackets, etc., must be above the bottom of the highest adjacent stringer.

1. Refer to Figure 9.05.01 – Facilities Next to Highest Adjacent Stringer for additional guidance.

B) Utility location on a structure which would inhibit access to any part for bridge inspection, painting or repair shall not be allowed. Clearances of the utility facility from bridge members shall conform to all governing codes; and at a minimum provide 18” of horizontal clearance from the edge of the girder flange.

C) Generally, acceptable utility installations are those which will occupy a position beneath the structure's deck between the outer girders or beams, or within a cell.

D) New utility installations on an existing bridge shall be placed a minimum of 18 inches from existing utilities.

9.05.04 Materials

A) All materials used for attaching a utility facility to the structure must be compatible with the structural material to eliminate the possibility of corrosion.

B) All metal components shall be in accordance with governing codes.

C) All material used in the utility facility attachments to the bridge structure must be approved by OOS.

9.05.05 Pipelines

A) All pipes carrying transmittants that are flammable, corrosive, expansive, energized, or unstable shall be cased throughout the length of the structure. (See Section 9.05.06 – Sleeves & Casings for Structures, for further guidance.)

1. Casing pipes may be omitted if approved by OOS.

B) The carrier pipe must be pressure tested before start-up in accordance with the latest edition of applicable industry codes, or appropriate regulations of an agency of the federal government.

C) Pipelines carrying liquids subject to freezing must be protected to prevent the liquids from freezing.

D) Gas Pipelines - Placement

1. Gas mains shall be located between beams so that no gas will be trapped in pockets between beams and diaphragms or installed with casing pipes that are vented to the atmosphere through screened vents.

a) The casing pipe may be omitted, but the area between beams shall be vented by suitable methods acceptable to the MDOT SHA whose design does not allow deck concrete and steel to be attacked by deicing salts.

2. Gas mains are to be supported by existing diaphragms where possible. Additional supports between diaphragms are to be placed as required. On existing structures these additional supports are to be attached to the beams by bolting. Welding to existing steel beams shall not be permitted. Where a gas main must be hung below the diaphragm, it is to be supported by hangers specially designed for this use.

E) Water and Sewer Pipelines - Placement

1. Water mains and sewer lines on structures are usually placed between beams, preferably between the fascia beam and the first interior beam. This will permit placing the pipe in the shoulder on the approaches to the bridge.

2. Piping is to be supported, if possible, by the existing diaphragms. Additional supports may be placed as required. They must be attached to the existing beams by bolts. Welding to existing beams shall not be allowed.

3. The piping may be placed on top of the diaphragms with U bolts or other suitable means to hold the pipe in place.

4. Hangers, if used, shall be of a type especially designed for this use.

5. Expansion joints for the piping shall be compatible with the expansion and contraction design of the bridge. The piping shall be fitted with Dresser Couplings, or approved equal, to enable adjustments for expansion, contraction, and deflection.

6. A crows-foot restraining device placed at each joint of sufficient length to facilitate removal of any section of pipe without damage or removal of an adjacent section is recommended.

9.05.06 Sleeves & Casings for Structures

A) Since a pipeline carrying a volatile fluid or gas under pressure can cause damage or injury if there is a leak, it poses a certain element of risk when mounted on a bridge. Likewise, attachment of a pipeline carrying a non-volatile fluid, such as sewer or water line, also poses a certain element of risk, with respect to leakage, where mounted on a bridge crossing a freeway, other highway or street, railroad, or water. In either case, when such a carrier is placed in a casing pipe of leak proof construction, leakage can be detected and exhausted at vents or drains and the casing becomes a "second line of defense" against damage to the structure.

B) All carrier pipes shall be cased throughout the length of the structure. The casing pipe shall be carried beyond the back of the bridge abutments and approach slabs and be effectively opened or vented at each end to a point beyond the approach slabs to prevent possible build-up of pressure and to detect leakage of gases or fluids. These vents shall be located outside the shoulder line behind the guard rail. (See Section 9.05.10 - Approaches & Transitions To and From Structures, for further guidance.)

C) Casings shall be approximately 3 inches larger than the outside diameter of the carrier pipe.

D) All piping systems under pressure shall state the maximum operating pressure and test pressure on the plans and on the label. (See Section 9.05.10 - Utility Facility Identification, for further guidance.)

E) Casing pipes should have provision to drain condensate.

F) The casing pipe must be designed to withstand the same internal pressure as the carrier pipe.

G) Exceptions to this requirement may be considered and approved by the OOS.

1. When sleeves or casings are not required for a pipeline attachment to a bridge, additional protective measures shall be taken. Such measures may include, but not limited to, carrier pipes having heavier than usual wall thickness, or higher yield strength for steel pipe, superior design and construction, radiograph testing of welds and hydrostatic testing.

9.05.07 Shut-Off Valves

A) On all facility attachments carrying gas or liquid under pressure, which, by nature of the transmittant or its pressure, might cause damage or injury if escaping on or in the vicinity of the highway structure, there shall be emergency shut-off valves.

B) Such valves shall be placed within an effective distance on the pressure side of the structure, unless the facility is equipped with nearby shut-off valves or operates under effective control by automatic devices.

C) If there is no shut-off valve on the pressure side of the main within 1000 feet of the structure, the MDOT SHA may require the installation of a valve closer to the structure.

9.05.08 Cathodic Protection

A) Utility facilities, such as gas, water, etc., which are attached to bridge structures shall be free of any impressed direct current for cathodic protection or shall be electrically isolated from the steel of the bridge.

B) When utility lines containing impressed direct current are to be attached to a bridge structure, the following precautions shall be taken unless other suitable protection is detailed on permit plans and details:

1. Insulating flanges or connections shall be installed beyond each backwall of the bridge structure for the purpose of insulating or isolating the section of the facility attached to the bridge structure from the underground sections of the facility containing impressed direct current for cathodic protection.

2. If necessary, the direct current shall be continued across the bridge through an insulated wire attached to the underground facility at each end of the bridge. This insulated wire shall be enclosed in metallic conduit. Both this conduit and the facility or its casing shall be insulated from the bridge structure. This conduit shall be grounded to a ground rod at each end of the bridge.

9.05.09 Power & Communication Lines

A) Power and communication lines to be attached to structures must be installed in conformance to National Electric Code and National Electric Safety Code requirements.

B) Electric power and communication lines attached to a highway structure must be insulated and isolated from the structure.

C) Electric power and communication lines attachments shall be carried in protective conduit or pipe throughout the length of the structure.

D) All conduits shall be installed in accordance with the UL listing information, the manufacturer's instructions (in regard to use of fittings and cementing of joints), and the applicable requirements in the National Electrical Code and National Electric Safety Code.

E) Metal sleeves through the abutment backwalls are to be provided for passage of the conduits.

F) The protective conduit or pipe shall be carried beyond the back of the bridge abutments and approach slabs to manhole at points beyond the approach slabs located at each end of the structure. (See Section 9.05.10 - Approaches & Transitions To and From Structures, for further guidance.)

G) Telephone and other low voltage (50 Volts or less) lines may be placed in plastic, fiberglass, or P.V.C. conduits.

H) High voltage lines may be placed in steel conduits, in UL listed schedule 40 or schedule 80 PVC conduit, or fiberglass reinforced epoxy conduit (not the type that is limited to underground use).

I) Exposed metallic conduit carrying electrical cables must be grounded separately from the structure.

J) Attachments for electric power and communication lines must provide sufficient clearance for convenience and safety during maintenance and repair of bridge structure or other utility installations on the bridge.

K) For the safety of persons using the bridge; signing to warn all users of the voltage shall be provided as set forth herein under Section 9.05.10 - Utility Facility Identification.

L) Power and Communication Lines – Placement

1. In Sidewalks (or Parapets)

a) On new structures and rehabilitated structures, the power or communication lines placed in conduits may be installed within the sidewalk or parapet area.

b) On an existing structure, removal and replacement of existing sidewalk and/or parapet to accommodate the lines in these areas may be acceptable, should this be the feasible alternative without cost to the Administration and with minimal inconvenience to traffic.

c) Installations in the sidewalk or parapet areas shall conform, to the extent applicable, with OOS, Structural Standards and Details, latest revision.

2. Between Beams

a) Power and communication lines to be installed on structures are to be placed in conduits.

b) Conduits are to be supported by existing diaphragms where possible. When additional supporting members are required, they are to be attached to the beams by bolts. No welding to existing steel shall be permitted.

c) Conduits are to be placed between the fascia and first interior beam, if possible.

9.05.10 Approaches & Transitions To and From Structures

A) Where the utility facility is to pass through a bridge abutment or end wall of an existing bridge, the Utility Company shall neatly restore the disturbed areas by methods which will prevent any leakage of water or backfill through the substructure elements.

1. Pipes and conduits installed through backwalls, or endwalls are to be extended through sleeves.
2. Where such construction is allowed, the hole created in the bridge endwall or abutment for the sleeve shall be of the minimum size.
3. The sleeve shall be tight-sealed into the opening and annular space between endwall or backwall and sleeve shall be completely filled with non-shrink grout, then caulked to seal such opening and effectively prevent the leakage of any moisture or backfill material through the abutment.
4. The annular space between the pipe conduit and the sleeve sealed as approved by OOS.

B) Where a utility facility is carried beyond the back of an endwall or backwall, generally it shall be required to extend beyond the approach slab and curve or angle so as to align outside the roadbed structure in as short a distance as is operationally practicable. Preferably it should be located in the first or closest bay of the structure (i.e. - not on the outside of the bridge).

1. Where attachment is considered, coring or cutting of edge beams or approach slabs shall not be allowed.
2. On endwalls, whose primary purpose is to retain the end fill, approval may be granted to core reasonable sized holes provided critical reinforcement is not cut.

C) Where manholes or vents are installed beyond the back of the bridge abutments and approach slabs of the structure, said manholes and vents shall be coordinated with the placement of any guardrail of the structure.

9.05.11 Utility Facility Identification

A) Any new or replacement utility facility installed from the date of this manual shall include an identification marker within the first and last 50 feet of the facility, and at intervals in-between not to exceed 100 feet.

1. The spacing shall be adjusted to have at least one marker in every bay of the bridge through which the utility passes.
2. Refer to Figure 9.05.11 - Markers within Bays of Bridges, for additional information.

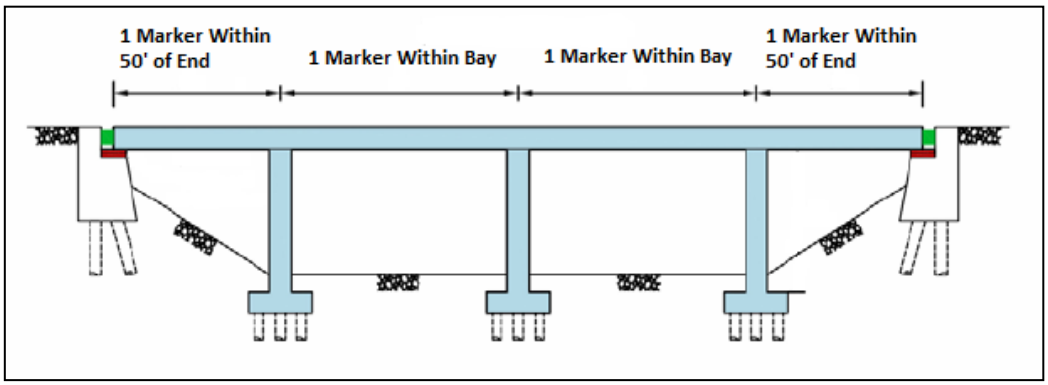


Figure 9.05.11 - Markers within Bays of Bridges

B) The marker shall consist of decals or stenciling onto the pipe or carrier conforming to industry standard color coding with high quality black or white print. See Figure 9.05.10 – Utility Markers, for examples color codes and print to be used.

1. Lettering height shall be one third the pipe diameter, but not smaller than one inch nor larger than four inches.

2. The marker shall include the name of the Utility and a description of the contents including pressures, voltages, and any other pertinent information required by industry standards.

C) Refer to Standard Specifications For Construction And Materials, Section 470 - UTILITIES ON STRUCTURES, for additional guidance

Label Background Color/ Lettering Color	Content
RED	***Electrical Power***
YELLOW	***Gas, Oil Steam, Petroleum or Gaseous Materials***
ORANGE	***Communication, CATV, Alarm, or Signal***
BLUE	***Potable Water***
PURPLE	***Reclaimed Water, Irrigation, or Slurry***
GREEN	***Sewer and Storm Drain***

Figure 9.05.10 – Utility Markers

9.06 STRUCTURES PROJECT COORDINATION

A) In addition to the requirements in this Section 9.06 – STRUCTURES PROJECT COORDINATION, utility design and construction associated with Highway Structures shall be performed in complete conformance with CHAPTER 8: PROJECT COORDINATION.

B) Where the MDOT SHA plans to construct a new bridge structure, the design of the structure may, upon request of a Utility Company, be reviewed for accommodation of existing or proposed utility installations consistent with the requirements set forth herein this Utility Manual Manual.

1. The proposed method of attachment should be described with preliminary drawings detailing the proposed horizontal and vertical alignment. Detailed plans will not be required at this point in time. (See Section 9.07.01 - Submittals, for further guidance.)

2. If OOS approves or conditionally approves the proposal, the Utility will be notified through the appropriate District Engineer or their approved designee. Quality full size plans shall be developed and submitted with electronic files. (See Section 9.07.01 - Submittals, for further guidance.)

3. The cost of the utility facility installation, including the additional bridge engineering and modifications, shall be borne by the Utility Company.

C) Where utility work is included in MDOT SHA's construction project, the coordination of utility work and bridge work will usually be minimal because both jobs will usually be performed by one contractor.

1. The Utility shall submit a Utility 3rd Party Work PS&E to the MDOT SHA for inclusion in MDOT SHA's construction project.

a) Refer to Section 7.09 - UTILITY 3RD PARTY WORK for additional guidance.

2. The Utility must commit to having the facility installed by the MDOT SHA contractor at the price assigned to this bid item within the MDOT SHA construction project bid, when the utility work is being accomplished as part of MDOT SHA's construction project.

D) Where work is performed directly by the Utility or its contractor, the Utility must coordinate with the MDOT SHA contractor in order that the project schedule shall not be affected.

1. A Utility shall be responsible for claims against the MDOT SHA if those claims were brought about through neglect and/or delays on the part of the Utility which caused the Contractor to incur expenses.

9.07 STRUCTURES REVIEW PROCESS

A) Submittals

1. Requests for bridge attachments and/or underground installations near a structure shall be submitted to the District Utility Engineer for transmittal to OOS unless otherwise directed by the appropriate District Engineer or their approved designee.

2. Submittals for review and approval of bridge attachments and/or underground installations near a structure must include enough information to clearly illustrate how the utility is to be installed.

3. Plans submitted to the MDOT SHA shall be as follows:

a) All plans must be referenced to NAD 83/91 and NAVD 88.

b) Only preliminary plan submittals may be submitted as full sized hard copy plans.

c) All other plan submittals shall be quality full-sized plans and shall include an electronic file with plans in 3D.dgn or MicroStation compatible format.

4. Submittals shall be considered incomplete until enough information is received to allow for a meaningful review.

5. Generalized, vague, or incomplete information will delay the review process and could potentially result in MDOT SHA's rejection of the request.

B) General Requirements

All submittals for review should, as a minimum, include the following:

1. State Route number and Milepost

2. Bridge number

3. As-built bridge details

4. Cross sections and/or elevation views

5. Description of proposed utility facility (type of utility, size/dimensions/voltage, etc.)

6. Other pertinent information

C) Submittals for Underground Installations Near Structures

In addition to general submittal information, utilities proposing installations near a structure shall include the following documents with the review transmittal:

1. A plan and elevation profile of the proposed utility location with references identifying adjacent bridge piers or retaining walls by MDOT SHA bridge name, and bridge, pier, or wall number.
2. A location cross section showing the horizontal and vertical relationship between the proposed installation and any adjacent bridge pier footings, wall footings, or existing utilities.
3. Specific information showing the relationship between the proposed utility and the 45-degree zone of influence from the bottom of any edge of a footing.
4. Information regarding the proposed method of installation.
5. Any Datum equations used to compare utility elevations to bridge as-built elevations.
6. Supporting documentation verifying compliance with the requirements of Section 9.04 - UNDERGROUND INSTALLATIONS NEAR STRUCTURES

D) Submittals for Bridge Attachment

In addition to general submittal information, utilities requesting attachments to a structure shall include the following documents with the review transmittal:

1. Requests for attachment must be accompanied by a complete explanation of the circumstances creating the need for the proposed attachment. Also, it must include a detailed breakdown (Labor-Equipment-Material) of estimated costs for all alternate location studies done of getting the facility over, under, or around the obstacle; and all reasons (with sufficient specificity and supporting detailed explanations for each reason) why none are feasible.
2. A description of the facility including the transmittant and the weight per lineal foot.
3. Details relative to the transmittant such as pressure, voltage, current, flammability, freeze point, and temperature
4. Appropriate devices to protect the bridge and the facility such as valves, circuit breakers, and pressure sensors should be provided and explained.
5. Bridge attachment details. (Utility hanger details, etc.)
6. Engineering calculations for attachments involving pressurized pipe systems, heavily loaded utilities, or as requested by the OOS.
7. A plan and elevation view showing the proposed utility location on the structure.
8. Horizontal dimensions from all bridge primary members (girder, stringer, beam, edge of slab, etc.).
9. Utility line expansion joint details and proposed locations.

10. Detail of bridge abutment showing the method of transitioning the utility on and off the bridge. Any excavations or borings at these locations should include a cross section with horizontal and vertical offsets.

11. Supporting documentation verifying compliance with the requirements of Section 9.05 - ATTACHMENTS TO HIGHWAY STRUCTURES.

9.08 BLASTING NEAR STRUCTURES

Blasting is generally not permitted within 100' of a bridge. When blasting is to be performed, the following criteria must be adhered to:

A) In addition to the requirements in this Section 9.08 - BLASTING NEAR STRUCTURES, any blasting shall be performed in complete conformance with Section 4.07.06 - Blasting.

B) Before any blasting is permitted, the Contractor, accompanied by a MDOT SHA Engineer, must inspect the existing structure, photographing, marking and noting any cracks, fractures and/or other signs of existing damage.

1. After the completion of the blasting the structure is to be reinspected by the Contractor together with the MDOT SHA Engineer.

C) Any enlargement of existing cracks, new cracks or other damage to the structure shall be considered to have been caused by the Contractor's blasting.

1. This additional damage shall be repaired or replaced at the Contractor's expense.

2. These repairs shall be made to the satisfaction of the MDOT SHA Engineer.

D) A seismograph is to be placed on the pier or abutment footing nearest to the point of blasting.

1. The seismograph is to be operated by a person qualified to read and interpret the information obtained.

E) Test shots using small charges and time delays are to be set off, noting the particle velocity as recorded by the seismograph.

1. A maximum of two (2") inches per second will be permitted.

2. The sizes and time delays of the main shots will be determined by the test shots, bearing in mind that the particle velocity shall not exceed 2" per second.

F) Even though the MDOT SHA specifies the maximum readings on the seismograph, this does not relieve the Contractor of responsibility for any damage sustained by the structure.

9.09 OUT-OF-SERVICE & DEACTIVATED FACILITIES

A) When a utility facility is no longer required on a structure, the Utility shall notify the appropriate District Engineer or their approved designee in accordance with Section 6.14 - OUT-OF-SERVICE & DEACTIVATED UTILITIES, Subsection C) Placing Facilities Out-of-Service.

B) At the discretion of the appropriate District Engineer or their approved designee, the MDOT SHA may:

1. Approve the request to allow the utility facility out-of-service or deactivated left in place;

a) The Utility shall comply with Section 6.14 - OUT-OF-SERVICE & DEACTIVATED UTILITIES, Subsection D) Out-of-Service and Deactivated Facilities Left In Place.

2. Require the removal of out-of-service or deactivated utility facilities and restoration of the right-of-way.

a) The removal and restoration shall be accomplished within six (6) months unless the Utility and the MDOT SHA agree on a different mutually agreeable timeframe.

b) The Utility shall restore MDOT SHA's right-of-way in accordance with Section 4.08 - RESTORATION.

c) The cost shall be the responsibility of the Utility Company.

3. Assume ownership of the out-of-service or deactivated utility facility, in its entirety or any portion or segment thereof.

a) If in the opinion of the appropriate District Engineer or their approved designee, the out-of-service or deactivated utility facility, in its entirety or any portion or segment thereof, may be used by the MDOT SHA for a transportation purpose or need or future transportation purpose or need.

b) The MDOT SHA may require the Utility to remove the cable, wire, carrier pipe or transmittant.

c) The Utility shall not be compensated by the MDOT SHA for assuming ownership of any out-of-service or deactivated utility facility, in its entirety or for any portion or segment thereof.

C) Refer to Section 6.14 - OUT-OF-SERVICE & DEACTIVATED UTILITIES for further guidance.

CHAPTER 10

SIGNALS, SIGNS
AND
OTHER TRAFFIC STRUCTURES

10.01 GENERAL

A) Installations on or near any of the following signals, signs, and other traffic structures require review and written approval by MDOT SHA's Office of Traffic & Safety (OOTS) unless otherwise specifically identified differently in this Chapter 10 prior to any permit being issued by the appropriate District Engineer or their approved designee or project approval by the Project Engineer. Traffic Structures and associated equipment include but are not limited to:

- **Traffic Signals**
  - Cabinets
  - Handholes
  - Poles
  - Mast Arms
  - Lighting Arms
  - Luminaires
  - Traffic Signal Indications
  - Span Wire
  - Hand boxes, Conduits/Cable
  - Service Pedestals
- **Roadway Signing**
  - Overhead/Cantilever sign structure foundations and supports
  - Ground Mounted signs
  - Bridge Mounted signs
- **Lighting**
  - Cabinets
  - Manholes
  - Poles
  - Lighting Arms
  - Luminaires
  - Service Pedestals
  - Hand boxes, Manholes, Conduits and Cable
- **ITS Equipment**
  - Dynamic Message Signs (DMS)
  - Traveler Advisory Radio (TAR)
  - Closed Circuit Television (CCTV)
  - Automatic Traffic Recorders (ATR)
  - Side-Fire Vehicle Detectors (SFVD)
  - Roadway Weather Information Systems (RWIS)
  - Service Pedestals
  - Manholes, Conduits and Cable

B) Requests to install facilities near or attach facilities to a structure shall be submitted, in writing, to the appropriate District Engineer unless otherwise directed by the appropriate District Engineer. See Section 10.07 - OFFICE OF TRAFFIC & SAFETY REVIEW PROCESS for further guidance.

C) Compliance with the installation or attachment requirements of this CHAPTER 10 – SIGNALS, SIGNS AND OTHER TRAFFIC STRUCTURES does not constitute automatic approval for said installation or attachment.

D) Any permit, project approval or OOTS approval allowing a Utility or Permittee to install facilities near any or attach to any traffic structure does not constitute any permanent right for such installation or attachment. Any removal, rehabilitation, maintenance, or relocation of the installation or attachment, whether required by MDOT SHA or not, shall be promptly accomplished by the Utility or Permittee at no cost to the MDOT SHA.

E) Installations or attachments that deviate from the preapproved submittal requests without prior approval from the OOTS shall be subject to removal.

F) Provisions for a utility attachment may be included during the design of a structure. See Section 10.05 - OFFICE OF TRAFFIC & SAFETY PROJECT COORDINATION for further guidance.

G) The utility company shall ensure that MSHA underground facilities are designated and shall remain operational throughout construction. In all cases, the utility or Permittee is responsible for restoration and repair of damage to the structure and/or the highway as a result of the construction, maintenance, and/or operation of the utility or facility.

10.02 GUIDANCE DOCUMENTS for TRAFFIC STRUCTURES

A) Any utility work in connection with Traffic Structures shall be in complete conformance with specifications, standards, provisions and policies of Section 1.08 - GENERAL GUIDANCE DOCUMENTS.

B) In addition to the documents referenced in the previous paragraph, design and construction associated with Traffic Structures shall be performed in complete conformance with, and particular attention to, the following MDOT SHA publications as applicable to the type of utility facility and/or type of work:

- Maryland Manual on Uniform Traffic Control Devices (MdMUTCD)
- Traffic Control Devices Design Manual
- Maryland Standard Sign Book
- Book of Standards for Highway & Incidental Construction
- Standard Specifications For Construction And Materials
- Supplemental Specifications and Provisions
- SHA Traffic Signal Design Training *
- SHA Electrical Training *
- SHA Lighting Training *
- SHA Lighting guidelines *
- SHA ITS Design Manual †
- Installation & Attachment of Non-SHA Devices Application Guidelines †
- EmPOWER Maryland Database and Procedures Manual †

* † These documents can be obtained from the MDOT SHA at:

MDOT SHA Office of Traffic and Safety
* Traffic Engineering Design Division (TEDD)
† Traffic Development and Support Division (TDSD)
7491 Connelley Drive
Hanover, MD 21076

C) Whenever MDOT SHA's Standard Specifications For Construction And Materials is referred to in this Chapter or this Utility Manual, the latest version of the Supplemental Specifications and Provisions shall be reviewed to ensure the most current specification is used.

10.03 AERIAL INSTALLATIONS NEAR TRAFFIC STRUCTURES

A) Aerial installations shall comply with all other sections and requirements of this Utility Manual including, but not limited to, CHAPTER 4 - UTILITY CONSTRUCTION, Section 6.11 - VERTICAL CLEARANCES, Section 6.12 – HIGH VOLTAGE LINE ACT, Section 2.01.01 – GUIDANCE DOCUMENTS FOR DESIGN, and Section 10.02 – GUIDANCE DOCUMENTS FOR TRAFFIC STRUCTURES.

1. The utility owner assumes all risk and liability for above ground and aerial installations that are installed near traffic structures with breakaway bases and transformers.

B) Aerial utility facilities shall not be placed near traffic structures at distances less than those listed below:

1. Transmission Electric (>180kV)
   - **a.** 10 feet + 0.4 inches for kV above 180 kV
   - **b.** Transmission Electric (>470kV)
     - **i.** In addition, the Utility shall coordinate with the MDOT SHA to determine any additional clearance distance requirements.
2. Primary Electric (>750V to 180kV)
   - **a.** 10 feet radial from conductor to traffic structure
   - **b.** Includes spun primary
3. Secondary Electric, excluding power service feeds to traffic structures (<750V)
   - **a.** 5 feet radial from conductor to traffic structure
4. Communication, Guys, Messengers
   - **a.** 3 feet horizontal
   - **b.** 2 feet vertical

C) Refer to Figure 10.03-1 Aerial Utility Clearances from MDOT SHA Traffic Structures, Section 2.01.01 – GUIDANCE DOCUMENTS FOR DESIGN, and Section 10.02 – GUIDANCE DOCUMENTS FOR TRAFFIC STRUCTURES for additional guidance.

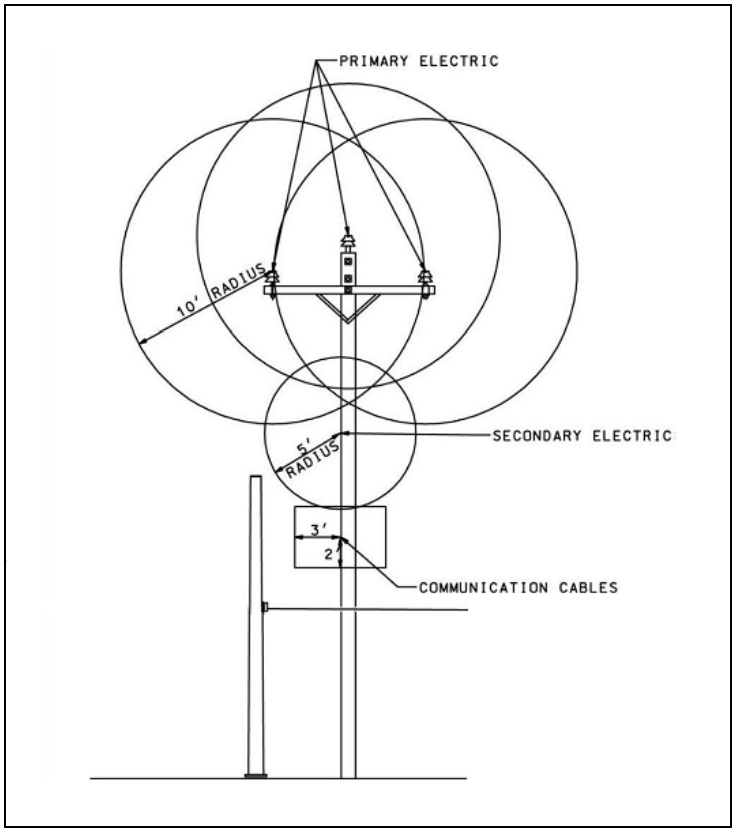


Figure 10.03-1 – Aerial Utility Clearances from MDOT SHA Traffic Structures

D) Installations of aerial utility facilities proposing to cross underneath any traffic structures shall be prohibited unless approved by MDOT SHA.

1. All requests for these installations shall be made to the appropriate District Engineer unless otherwise directed by the appropriate District Engineer.

2. Approval for these installations shall be from the appropriate District Engineer (or approved designee) via the Utility Permit.

E) Aerial utility facilities shall not obstruct the view or performance of traffic control devices and ITS equipment listed in Section 10.01 (A). The following are strictly prohibited:

1. Aerial utility facilities that obstruct and/or affect the performance of traffic control devices.

a) These installations can result in hazardous conditions for the traveling public. Such installations may result in the utility installer and/or owner being held legally responsible for adverse consequences.

b) Partial obstructions are also not considered acceptable.

2. Cables resting on traffic structures and associated equipment.

3. Cables obstructing view of signal heads, signs or other traffic control devices that must be seen.

F) Aerial utility facilities installed at signalized intersections shall have a minimum vertical clearance of 23 feet.

1. If the aerial utility facility is within the Clearance Zone of the National Electric Safety Code (NESC), the minimum vertical clearance shall be 23 feet **plus** the required clearance of the NESC.

2. Refer to Section 6.11 (D) Vertical Clearances and Figure 6.11 Signalized Intersection Vertical Clearances for additional guidance.

10.04 UNDERGROUND INSTALLATIONS NEAR TRAFFIC STRUCTURES

A) For installations of underground utility facilities within ten feet of MDOT SHA traffic structures, the Utility shall submit a request for installation for review and approval from both the OOTS and the appropriate District Engineer or their approved designee.

1. All requests for these installations shall be made to the appropriate District Engineer unless otherwise directed by the appropriate District Engineer.

2. Approval for these installations shall be from the appropriate District Engineer or their approved designee via the Utility Permit unless work is Utility 3rd Party Work incorporated into MDOT SHA's construction project.

3. Refer to Section 10.07 - TRAFFIC STRUCTURES REVIEW PROCESS for additional guidance.

C) All underground installations near structures, when permitted, shall meet the following requirements:

1. Installations shall be outside the 45-degree Zone of Influence from the top of any edge of a traffic structure footing or foundation. Figure 10.04-1 – Traffic Structure Zone of Influence, illustrates these limits.

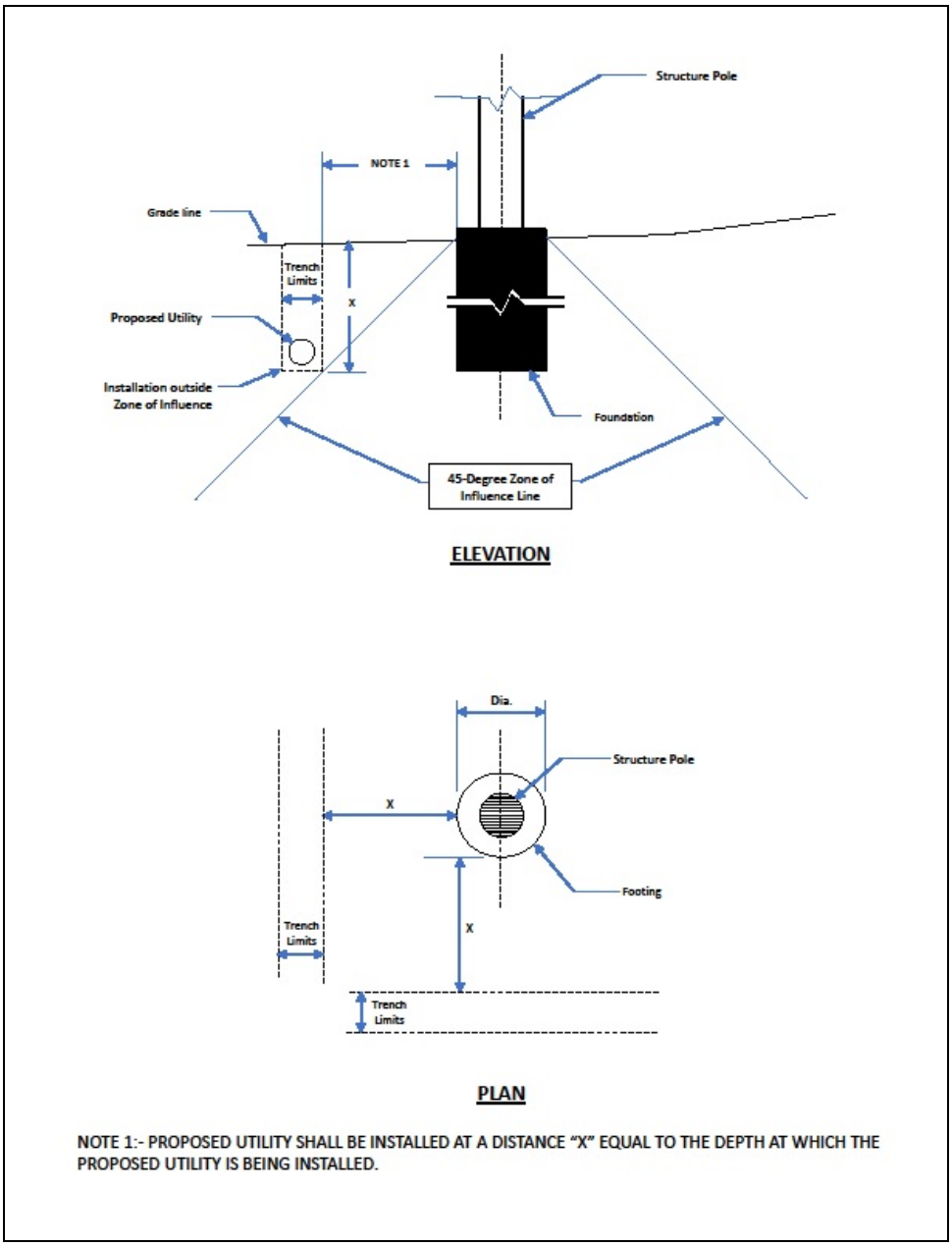


Figure 10.04-1 – Traffic Structure Zone of Influence

2. The proposed method of installation shall not, in any way, be detrimental to the structure or foundation.

3. Carrier pipes of all pressurized utilities shall be pressure tested before start-up in accordance with the latest edition of applicable industry codes, or appropriate regulations of an agency of the federal government.

D) Excavation around traffic structures and installation of underground utilities shall not jeopardize the structural integrity of any traffic structure.

E) The proposed method of installation shall not, in any way, be detrimental to the traffic structure or foundation.

10.05 ATTACHMENTS TO TRAFFIC STRUCTURES

A) Attaching utility lines to a traffic structure can materially affect the integrity and appearance of the structure, the safe operation of traffic, future modifications, and the efficiency of maintenance. Therefore, the MDOT SHA has adopted a general requirement of discouraging attachments to traffic structures except where there is no other feasible and reasonable place to locate utility facilities. Where it is feasible and reasonable to locate utility facilities elsewhere, attachments to highway structures will not be permitted.

1. Traffic signals primary function is for safety. Therefore, any attachment to traffic signals are strictly prohibited.

B) However, where other locations prove to be difficult, unsafe and/or unreasonably costly, consideration may be given for attaching a utility to a highway structure and only when all of the following conditions exist:

1. No other practicable alternative is available, including private easement

2. The attachment will not create a hazard to the public

3. The public interest will suffer if approval is not granted

4. The structural integrity of the structure will not be threatened by the attachment

5. None of MDOT SHA's basic interests will be substantially compromised by the attachment, including reasonable ease of bridge inspection and maintenance.

C) Refer to Installation & Attachment of Non-SHA Devices Application Guidelines from MDOT's Office of Traffic and Safety – Traffic Engineering Design Division for additional guidance.

10.05.01 General

A) When it is not feasible to avoid the installation of non-MDOT SHA devices, at MDOT SHA's sole discretion, that are owned and operated by other agencies within MDOT SHA ROW, construction of a separate structure for non-MDOT SHA devices should be considered.

1. The location of this new structure will require prior approval from the MDOT SHA and must meet all the design and construction standards of the MDOT SHA.

2. Any such device must be in compliance with any applicable FHWA rules and regulations regarding installation of devices on federally funded roadways.

B) The device owner shall submit a request that includes the design specifications and installation details of the device, along with justification for placement of the device in the ROW to the appropriate District for attaching non-SHA device to SHA TCD structures.

1. Refer to Section 10.07 - TRAFFIC STRUCTURES REVIEW PROCESS for additional guidance.

C) The device owner shall enter into an MOU with the MDOT SHA for each device installation or set of devices that sets forth responsibilities for device maintenance, inspection, removal, emergency responses, construction, and relocation. SHA shall bear no cost for any of these items.

D) Attaching devices on MDOT SHA signal posts or signal structures and wiring to cabinets shall not be permitted.

E) Non-MDOT SHA devices shall not be placed in, on, above, or under the travelled portions of the roadway or within the safety recovery area of the roadway.

Review and approval of any mounting system, method of attachment to the structure, safety regarding the mounting system, and location of the attachment shall be by the Office of Traffic & Safety, Traffic Engineering Design Division.

F) Non-MDOT SHA devices shall meet all SHA operational and design standards and criteria including, but not limited to the following:

1. Power supply should be independent of any SHA power.

a) Power Feed

i. The device owner shall install a metered service pedestal near the existing traffic signal cabinet and obtain power from this location for its device.

ii. The SHA is responsible for coordination of the new power feed to the proposed metered service pedestal with the appropriate power company.

iii. The installation and all costs associated with the installation of the proposed power feed will be the responsibility of the device owner.

iv. The power usage charges will continue to be paid by the current party responsible for all power consumption charges.

v. The device owner is responsible for providing conduit and electrical cables (per SHA Standards) from the metered service pedestal to the signal cabinet.

b) Grounding

i. The device owner shall use a No. 6 A.W.G. Stranded Bare Copper Ground Wire to connect all of its structures to the ground rod located in the metered service pedestal.

2. There should be non-interference with or inhibiting existing or future SHA equipment or device installation.

3. Device owner must be responsible for all electric costs, and all communication costs.

4. Safety hazards must not be created.

5. The devices must be installed and/or attached appropriately to the SHA structures, and meet NCHRP 350/Manual Assessing Safety Hardware (MASH) crashworthiness guidelines where applicable.

6. The device must contain an inscription of the phone number of the device owner. That number should be accessible around the clock.

7. Non-SHA devices shall be in conformance with in conformance with:

a) Maryland Manual on Uniform Traffic Control Devices (MdMUTCD)

b) Standard Specifications For Construction And Materials, as revised and supplemented from time to time.

c) Traffic Control Devices Design Manual, as revised and supplemented from time to time.

d) AASHTO's Policy on Geometric Design of Highways and Streets, as revised and supplemented from time to time.

e) The AASHTO Roadside Design Guide, as revised and supplemented from time to time.

f) The High Voltage Line Act (Article 89, Sections 58 to 63, inclusive, of the Annotated high Code of Maryland).

g) The National Electric Code and the National Electric Safety Code, as each is revised and supplemented from time to time.

h) The Illuminating Engineering Society of North America's American National Standard Practice for Roadway Lighting ANSI/IESNA RP-8-00; as revised and supplemented from time to time.

i) Book of Standards for Highway & Incidental Construction

j) AASHTO Standard Specifications for Structural Support for Highway Signs, Luminaries and Traffic Signals.

k) All other applicable codes.

G) The design and installation of non-SHA devices may utilize SHA existing facilities; if all the wires associated with the device is placed in an orange protective sleeve. The protective sleeve shall separate the device wires from existing SHA cables/wires at all times, including but not limited to handholes, conduit, signal structures, and span wire.

H) Where additional lighting is required for the operation of the device, the device owner shall be required to follow current SHA lighting standards. All requests for modifying the existing roadway lighting shall be reviewed and approved by SHA.

a) Photometric data for roadway luminaires shall be submitted. Point by point lighting calculations shall be provided. The printouts shall show predicted horizontal foot-candles and veiling luminance ratios for the roadway. All calculated lighting levels for roadway lighting shall be not less than the levels specified in I.E.S.N.A. RP-8-00 American Standard Practice for Roadway Lighting.

I) Final inspections shall be required for the installation of each non-SHA device location.

a) The device owner shall contact the Traffic Control Device Inspection Division (TCDIS) at 410-787-7643 to request a final inspection at least seventy-two (72) hours prior to the final inspection.

J) In the event that the device requires removal, the device owner shall be responsible for the removal of the old electrical service and all old meters and disconnects.

a) Refer to Section 10.08 - OUT-OF-SERVICE & DEACTIVATED UTILITY FACILITIES; AND TERMINATION OF SERVICE TO MDOT SHA FACILITIES for additional guidance.

b) The cost of the removal shall also be the responsibility of the device owner.

K) In the event that the device requires relocation during reconstruction, the device owner will be asked to remove the device at no cost to SHA.

10.06 OFFICE OF TRAFFIC & SAFETY PROJECT COORDINATION

A) In addition to the requirements in this Section 10.06 – OFFICE OF TRAFFIC & SAFETY PROJECT COORDINATION, utility design and construction associated with Traffic Structures shall be performed in complete conformance with CHAPTER 8 – PROJECT COORDINATION.

B) Where the MDOT SHA plans to construct a new traffic structure, the design of the structure may be revised due to the most feasible location for power and/or communications service from the Utility Company existing facilities.

1. Refer to EmPOWER Maryland Database and Procedures Manual from MDOT's Office of Construction – Utilities Division for additional guidance.

10.07 TRAFFIC STRUCTURES REVIEW PROCESS

A) Submittals

1. Requests for aerial installations near a traffic structure; underground installations near a traffic structure; and or an attachment to a traffic structure shall be submitted to the District Utility Engineer for transmittal to OOTS unless otherwise directed by the appropriate District Engineer or their approved designee.

2. Submittals for review and approval of traffic structure attachments must be made to the appropriate District Engineer (or approved designee) for transmittal to OOTS and include enough information to clearly illustrate how the utility is to be installed and show proposed distances from existing traffic structures.

3. Plans submitted to the MSHA shall be as follows:

a) All plans must be referenced to NAD 83/91 and NAVD 88.

b) Only preliminary plan submittals may be submitted as full sized hard copy plans.

c) All other plan submittals shall be quality full-sized plans to scale and shall include an electronic file with plans in 3D.dgn or MicroStation compatible format.

4. Submittals shall be considered incomplete until enough information is received to allow for a meaningful review.

5. Generalized, vague, or incomplete information will delay the review process and could potentially result in MDOT SHA's rejection of the request.

B) General Requirements

All submittals for review should, as a minimum, include the following:

1. State Route number and Milepost

2. Traffic Structure number (if applicable)

3. As-built traffic structure details

4. Cross sections and/or elevation views

5. Other pertinent information

6. Support for excavation details

7. Protection of existing equipment

8. Description of proposed utility facility (type of utility, size/dimensions/voltage, etc.)
9. Limit of Disturbance
10. North Arrow
11. Scale of Drawing
12. Supporting calculations

C) Submittals for Underground Installations Near Traffic Structures

In addition to general submittal information, utilities proposing underground installations near a traffic structure shall include the following documents with the review transmittal:

1. A plan and elevation profile of the proposed utility location with references identifying adjacent foundations by MSHA foundation name.
2. A location cross section showing the horizontal and vertical relationship between the proposed installation and any adjacent foundations or existing utilities.
3. Information regarding the proposed method of installation.
4. Any Datum equations used to compare utility elevations to TCD and ITS structure as-built elevations.
5. Supporting documentation verifying compliance with the requirements of Section 10.04 - UNDERGROUND INSTALLATIONS NEAR TRAFFIC STRUCTURES.

D) Submittals for Aerial Installations Near Traffic Structures

In addition to general submittal information, utilities proposing aerial installations near a traffic structure shall include the following documents with the review transmittal:

1. A plan and elevation profile of the proposed utility location with references identifying adjacent traffic structures.
2. A location cross section showing the horizontal and vertical relationship between the proposed installation and any adjacent traffic structures or existing utilities.
3. Information regarding the proposed method of installation.
4. Any Datum equations used to compare utility elevations to traffic structures as-built elevations.
5. Supporting documentation verifying compliance with the requirements of Section 10.03 – AERIAL INSTALLATIONS NEAR TRAFFIC STRUCTURES.
6. Documentation that the view or performance of traffic control devices and ITS equipment will not be obstructed.

E) Submittals for Attachments to Traffic Structures

1. The MDOT SHA will only accept requests made from the entity that owns and operates the non-MDOT SHA devices.
2. In addition to general submittal information, utilities proposing installations on a traffic structure shall include the following documents with the review transmittal:

a) Location study report that will be used to justify the request

b) The specific location of each proposed or substantially revised device for installation or attachment

c) A statement of the purpose and technical specifications of the device and installation methods

3. The device owner shall submit request packages for review to the appropriate District Office for transmittal to Office of Traffic & Safety, Traffic Engineering Design Division and shall include, or conform to, the following items:

a) All plans shall follow TEDD CADD Standards

b) Five paper copies of the plans

c) A plan which includes existing field measured lighting levels, if necessary

d) All associated electronic files

e) Estimated utility installation fee

10.08 OUT-OF-SERVICE & DEACTIVATED UTILITY FACILITIES; AND TERMINATION OF SERVICE TO MDOT SHA FACILITIES

A) When a utility facility is no longer required on a structure, the Utility shall notify the appropriate District Engineer or their approved designee in accordance with Section 6.14 - OUT-OF-SERVICE & DEACTIVATED UTILITIES, Subsection C) Placing Facilities Out-of-Service.

B) At the discretion of the appropriate District Engineer or their approved designee, the MDOT SHA may:

1. Approve the request to allow the utility facility out-of-service or deactivated left in place;

a) The Utility shall comply with Section 6.14 - OUT-OF-SERVICE & DEACTIVATED UTILITIES, Subsection D) Out-of-Service and Deactivated Facilities Left In Place.

2. Require the removal of out-of-service or deactivated utility facilities, including wiring, and restoration of the right-of-way.

a) The removal and restoration shall be accomplished within six (6) months unless the Utility and the MDOT SHA agree on a different mutually agreeable timeframe.

b) The Utility shall restore MDOT SHA's right-of-way in accordance with Section 4.08 - RESTORATION.

c) MDOT SHA reserves the right to ask for a list of equipment to be removed.

d) The cost shall be the responsibility of the Utility Company.

CHAPTER 11

MAINTENANCE OF TRAFFIC

11.01 GENERAL

A) This Chapter 11- Maintenance of Traffic (MOT) sets forth the requirements necessary for the safe and continuous traffic control throughout the area affected by the work, and is intended to minimize inconveniences to the traveling public, while providing for the safety of motorists, pedestrians, and workers.

B) The Utility shall develop MOT based on MDOT SHA's Work Zone Safety and Mobility Policy; and on any specific directions received from the appropriate District Engineer or their approved designee.

C) When developing the MOT for any work to be performed within MDOT SHA rights-of-way, the Utility shall use the roadway type that best fits the descriptions contained in Standard No. MD 104.01-01 of the Book of Standards for Highway & Incidental Structures.

1. The MDOT SHA shall review and approve all changes, modifications or alterations to the Utility's MOT.

2. The MDOT SHA may modify and/or expand the Utility's MOT if in the opinion of the appropriate District Utility Engineer or Permit Inspector; the Utility's operations are a detriment to the safe and efficient flow of traffic, bicyclists, or pedestrians.

3. In the event that the MDOT SHA is required to provide traffic control due to the Utility's failing to maintain a safe work zone, all costs and applicable overheads shall be billed directly to the Utility.

a) In the event that a 3rd party caused a situation or emergency which required the MDOT SHA and/or the Permittee to provide traffic control, all costs and applicable overhead shall be billed directly to the 3rd party that caused the situation or emergency.

D) All applicable Maintenance of Traffic equipment shall conform to NCHRP Report 350 criteria for test Level 3.

E) When no longer needed, all items used for temporary MOT shall be removed from the project site.

F) Traffic Control signs or devices identified as unsatisfactory by the District Utility Engineer or his representative shall be replaced immediately.

G) The use of emergency crossovers is strictly prohibited.

H) Precautions shall be taken, particularly in freezing temperatures, to keep water off travel lanes.

I) Vehicular access to private and public driveways, entrances and roadways is to be maintained at all times.

J) Access to fire hydrants, firehouses, hospitals and mailboxes is to be maintained at all times.

11.01.01 Traffic Signals, Signs and Pavement Markings

A) The Utility shall exercise extreme caution when in the vicinity of signalized intersections so as to protect and maintain all traffic signal poles, wires, conduits and equipment associated with traffic signalization in good working order.

B) Traffic signs are not to be removed or relocated without permission of the District Utility Engineer.

C) Pavement Markings

1. The utility shall inventory existing pavement markings in the work area prior to application.

2. All pavement markings and symbols shall be completely replaced immediately upon the completion of milling or resurfacing, prior to the reopening to traffic.

3. Pavement marking material shall be submitted to MDOT SHA for approval prior to application.

11.02 GUIDANCE DOCUMENTS for MOT

A) MOT shall be in complete conformance with specifications, standards, provisions and policies of Section 1.08 - GENERAL GUIDANCE DOCUMENTS.

B) In addition to the documents referenced in the previous paragraph, design and construction associated with Work Zone Traffic Control shall be performed in complete conformance with, and particular attention to, the following MDOT SHA publications as applicable to the type of utility facility and/or type of work:

- Work Zone Safety and Mobility Policy
- High Visibility Apparel Policy
- Maryland Manual on Uniform Traffic Control Devices (MdMUTCD)
- Traffic Control Devices Design Manual
- Lane Closure Analysis's Guidelines
- Maryland Standard Sign Book
- Book of Standards for Highway & Incidental Structures
- Standard Specifications For Construction And Materials
- Supplemental Specifications and Provisions
- SHA's Accessibility Policy & Guidelines for Pedestrian Facilities along State Highways
- MDOT SHA's Bicycle Policy and Design Guidelines

Note: Copies of the above mentioned publications can be obtained from the Maryland State Highway Administration's website: https://roads.maryland.gov/pages/home.aspx in the drop down menu: Business Center > Business Standards and Specifications

C) Whenever MDOT SHA's Standard Specifications For Construction And Materials is referred to in this Chapter or this Utility Manual, the latest version of the Supplemental Specifications and Provisions shall be reviewed to ensure the most current specification is used.

11.03 WORK ZONE TRAFFIC CONTROL PLAN

A) An approved WZTC Plan is required for all work performed within MDOT SHA right-of-way.

B) The Utility is responsible to submit a carefully designed Work Zone Traffic Control (WZTC) Plan to the appropriate District Engineer or their approved designee for any relocation or permit work affecting a highway.

1) The WZTC plan shall be in complete accordance with the documents in Section 11.02 – GUIDANCE DOCUMENTS for MOT and any specific directions received from the appropriate District Engineer or their approved designee.

2) The WZTC plan shall address vehicular, bicycle and pedestrian traffic on or along any transportation facility in accordance with MDOT SHA's Work Zone Safety and Mobility Policy; and on any specific directions received from the appropriate District Engineer or their approved designee.

3) The WZTC Plan should indicate the time during which work is to be done as well as the proposed placement of signs and layout of traffic control devices.

4) The MDOT SHA may modify and/or expand the Utility's WZTC Plan.

C) When speed of traffic is noted, this means the posted speed or prevailing travel speed; whichever is higher, unless otherwise specified.

D) All changes, modifications or alterations to the approved WZTC Plan shall be submitted in writing to the District Utility Engineer in advance for review and approval.

11.04 TRAFFIC MANAGER

A) A certified Traffic Manager shall be specifically designated for each permit application or Project within MDOT SHA rights-of-way. This identification shall include a 24-hour contact telephone number. The Traffic Manager will be responsible for ensuring the proper implementation and maintenance of the WZTC Plan as well as conducting regular day and night inspections of the traffic control devices and overall traffic operations.

B) Utility Personnel may obtain an approved Traffic Manager certification from Maryland Transportation Builders and Materials Association (MTBMA). Information on Traffic Manager certification can be obtained from MTBMA's website at http://www.mtbma.org/

11.05 BICYCLIST & PEDESTRIAN TRAFFIC

A) Maryland public policy states that best engineering practices regarding the needs of bicyclists and pedestrians shall be employed in all phases of transportation planning, including highway design, construction, reconstruction, and repair as well as expansion and improvement of other transportation facilities.

B) In an effort to maintain accessibility for both bicyclists and pedestrians, the MDOT SHA has developed guidelines for providing space for bicyclists and pedestrians through work zones. This is especially important where the adjacent land use supports bicycling and walking such as residential, commercial, education, and employments centers as well as transit stations. Closing or detouring a roadway for construction impacts more bicyclists and pedestrians in urban areas; however there are typically more options available in these areas to provide alternate routes. In rural areas there may not be a large population of bicyclists or pedestrians, however, because of the open space and separation between communities, closing or detouring a roadway may increase a person's route significantly. Consequently, all permits and projects should be reviewed and evaluated on a case-by-case basis to determine what impact construction might have on bicycle and pedestrian access.

C) The Utility shall provide for bicycle and pedestrian access through work zones for all permits and projects where applicable and to the maximum extent feasible.

1. Provisions for bicycle and pedestrian access shall be clearly shown on the WZTC plan.

a) Refer to MDOT SHA's Bicycle Policy & Design Guidelines for additional information and guidance.

b) Refer to MDOT SHA's Accessibility Guidelines for Pedestrian Facilities along State Highways for additional information and guidance.

2. Refer to the documents identified in Section 11.02 – GUIDANCE DOCUMENTS for MOT for additional information and guidance.

D) The Utility shall submit plans for all proposed road closings or detours to MDOT SHA's Bicycle and Pedestrian Coordinator for review and comment.

11.06 DEVICES

A) All traffic control devices shall comply with performance criteria published in the National Cooperative Highway Research Program (NCHRP) Report 350, "Recommended Procedures for the Safety Performance Evaluation of Highway Features." Which can be found at http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_350-a.pdf.

B) Channelizing devices shall have at least 80 percent of the reflectivity over 90 percent of the reflectorized surface as specified in Section 950.03 of the Standard Specifications For Construction And Materials.

C) At least 90 percent of all reflective barrier markers, warning lights, and raised pavement markers shall be operational at any given time.

1. The Utility shall correct deficiencies within 24 hours after notification.

D) High performance wide-angle retro-reflective sheeting for signs, fluorescent orange in color, shall be used on projects along interstate highways and other freeways, unless otherwise specified.

E) Type VI (vinyl microprismatic) retro-reflective sheeting conforming to ASTM D 4956 is acceptable for use on roll up signs and channelizing devices.

11.07 SIGNS

A) Upon initial installation, temporary traffic control signs shall have at least 70 percent of the reflectivity over 90 percent of the reflectorized surface as specified in Section 950.03 of the Standard Specifications For Construction And Materials.

B) The Utility shall replace damaged traffic control signs within four hours of notification and take necessary corrective action, as approved, to adequately warn and protect the public until the signs are replaced.

C) When temporary traffic control signs are not indicative of actual conditions (e.g. temporary shut downs, overnight, or other periods when work is not being performed) the signs shall be removed, turned away from traffic, or completely covered.

D) Sign details are available from MDOT SHA's Office of Traffic & Safety, Traffic Engineering Design Division.

11.07.01 Specific Signing Instructions

A) Signing: Steel Plates

1. "STEEL PLATE" warning signs, W8-8(4), shall be 48" x 48" and shall conform to MdMUTCD and Maryland Standard Sign Book.

2. When steel plates are used to bridge open cut excavations within MDOT SHA pavement areas, signs shall be placed approximately 500 feet in advance of the steel plates.

3. Location and spacing of these signs will depend on field conditions and is subject to approval by the MDOT SHA's Permit Inspector.

4. The identification of the Utility Company, contact individual and 24-hour telephone number shall be clearly marked on the rear face of the "STEEL PLATES" warning sign.

5. In addition, from October through April, steel plates shall be identified by the placement of a grade stake located at the pavement edge immediately adjacent to the steel plates for identification during snow events. The stake is to be at least three feet high, painted international orange and shall be visible to the traveling public.

B) Utility Identification Signs

1. The Utility is required to provide or install signs identifying their organization and telephone number. Signs shall provide all of the following information:

a) the name of the owner of the utility

b) the name of the contractor that is performing the work

c) a 24-hour telephone number for the contractor

d) Overall dimensions may be modified to fit the name of the Utility with approval of the appropriate District Engineer or their approved designee.

e) The number and spacing of these identifying signs shall be subject to the approval of the MDOT SHA District Utility Engineer.

2. MDOT SHA facilities will not be used to provide or install the signs or their supports. Identifying signs shall be erected immediately before the start of the Utility's work operations and must be removed immediately upon completion of permanent construction and restoration.

11.08 WORKING HOURS

A) Work is permitted Monday through Friday only. Working hours for roadway and shoulder closures are typically restricted to between 9:00 AM and 3:00 PM and 9:00 PM and 5:00 AM. Work not adjacent to travel lanes is permitted between 7:00 AM and 7:00 PM.

1. Exceptions to these hours may be specified in the individual permit.

2. All requests for additional special exceptions shall be provided in writing to the Office of the District Utility Engineer.

B) Night work is prohibited in residential areas.

C) Work may also be restricted for special events occurring along specific routes. Information regarding specific special event restrictions can be obtained from the Office of the District Utility Engineer prior to any special event.

1. Additional work restrictions, if any, will be noted in the individual Work Order Utility Permit.

D) Any deviation from the approved traffic control standard for the Individual Work Order Utility Permit, such as when construction plans are revised, or differing site conditions encountered, shall be approved by the MDOT SHA Permit Inspector prior to the commencement of work.

E) The MDOT SHA reserves the right to modify and/or restrict working hours, or deny permission to work within MDOT SHA rights-of-way at any time if, in the opinion of the Engineer or Inspector, the Contractor's operations are a detriment to the safe and efficient flow of traffic.

11.08.01 Holidays

A) No work is allowed on the day(s) of major holidays or holiday weekends, or days preceding and following said holiday(s) or holiday weekends. Holiday restrictions may vary by location. Information regarding specific holiday restrictions can be obtained from the Office of the District Utility Engineer prior to each holiday. The National holidays mentioned are listed as follows: (These may or may not be the same as the State holiday).

NATIONAL HOLIDAYS:

New Year's Day, January 1
Martin Luther King's Birthday, the third Monday in January
President's Day, the third Monday in February
Memorial Day, the last Monday in May
Independence Day, July 4
Labor Day, the first Monday in September
Columbus Day, the second Monday in October
Veteran's Day, November 11
Thanksgiving Day, the fourth Thursday in November
Christmas Day, December 25

11.09 LANE CLOSINGS

A) The MDOT SHA is committed to the continuous movement of traffic through all work zones by the elimination or reduction of delays. To minimize the severity and duration of mobility impacts on the traveling public resulting from the work zone, all roadwork projects shall be adequately evaluated and analyzed. Planned lane closures that do not cause traffic flow bottlenecks and result in only minor levels of congestion are an effective traffic management strategy.

B) Compliance with these requirements will likely benefit the traveling public and the Utility by reducing work zone crashes and delays.

C) The Utility shall apply for and obtain a Traffic Control Permit from the appropriate District Office prior to closing any lanes.

1. Any modifications to the mandatory conditions contained in the guidelines require approval by the appropriate District Engineer or their approved designee.

D) The appropriate District Engineer or their approved designee will approve the time schedules and numbers of lanes involved for lane closings.

1. Full or temporary roadway closures for non-emergency situations are not permitted without prior approval of the District Utility Engineer.

E) All lane closures will be during off peak hours.

F) Flashing arrow panels, as early warning devices, shall be used whenever a lane is closed unless considered unnecessary by the appropriate District Engineer or their approved designee.

G) The Utility shall provide a minimum of two Portable Variable Message Signs (PVMS) for any temporary roadway detour or roadway closure.

1. Sign messages shall be approved by the District Utility Engineer prior to display.

H) Under certain circumstances, a Portable Variable Message Signs (PVMS) may be required.

1. The corresponding job-specific permit will provide details about what message shall be displayed, how much advance notice shall be given, etc.

I) Travel lanes and shoulders shall be restored immediately in the event of the following:

1. Precipitation - Lane and shoulder closures on wet roadways are strictly prohibited.

2. Accident or emergency within or adjacent to the work area.

3. Specific direction of any representative of the MDOT SHA.

J) The Utility is responsible to coordinate all lane closure activities with adjacent contractors.

K) When a lane, ramp or shoulder closure is in effect, work shall begin within one hour after the lane is closed.

L) Once work is completed, travel lanes and shoulders are to be restored immediately.

M) The Utility is responsible for coordinating Maryland State Police assistance for any temporary roadway closure.

1. No temporary roadway closure can exceed 15 minutes in duration.

N) Delay to motorists traveling through work zone lane, ramp or shoulder closures shall not exceed the thresholds in accordance with MDOT SHA's Lane Closure Analysis's Guidelines .

O) No travel lane shall be reduced to less than ten (10) feet in width at any time.

P) Prior to reopening, all travel lanes and shoulders shall be completely cleared of all materials, equipment and debris.

11.10 FLAGGING

A) All flagging operations are to be performed by individuals who have successfully completed MDOT SHA's Approved Flagger training course.

1. Utility Personnel may obtain an approved Flagger certification from the American Traffic Safety Services Association (ATSSA). Information on Flagger certification can be obtained from ATSSA's website at http://www.atssa.com/

B) Each flagger is to have in their possession an approved SHA flagger training card at all times.

C) Flagging is to be conducted utilizing stop/slow paddles in complete accordance with Part VI Section 6F of the current edition of the MdMUTCD.

D) Flaggers are to be appropriately attired at all times.

E) Flaggers shall wear a reflective vest, meeting the requirements of MDOT SHA's High Visibility Apparel Policy, at all times while flagging.

11.11 PAVEMENT EDGE DROP-OFF

A) All MOT which includes pavement drop-offs shall be in compliance with this CHAPTER 11 - MAINTENANCE OF TRAFFIC and the Complete Authorized Utility Permit.

B) During construction and maintenance activities involving pavement surfacing and resurfacing work, including shoulders, it often becomes necessary to maintain traffic along side or near lanes and shoulders having different elevations (drop-offs). Special traffic control devices are

needed to safely protect and guide traffic through such areas. The following are the traffic control requirements for pavement drop-off situations:

C) Pavement Edge Drop-offs of 2 ½ Inches or Less

1. Pavement edge drop-offs of 2 ½ inches or less shall be in compliance with Book of Standards for Highway & Incidental Structures, Standard Nos. MD 104.06-15 or MD 104.06-16 as appropriate.
2. Adjacent pavement elevation differences, drop-offs, of 2 ½ inches or less may be freely crossed by traffic.
3. Uneven joints where traffic can be anticipated to cross are to be tapered with a minimum of two feet of a bituminous concrete product for the entire width of the travel lane crossing.
4. Temporary transverse tie-in transitions during the paving operation shall be in accordance with Standard Specifications For Construction And Materials Section 504.03.09 - Tie-In. The transverse tie-in shall be completed prior to traffic being allowed on the pavement.

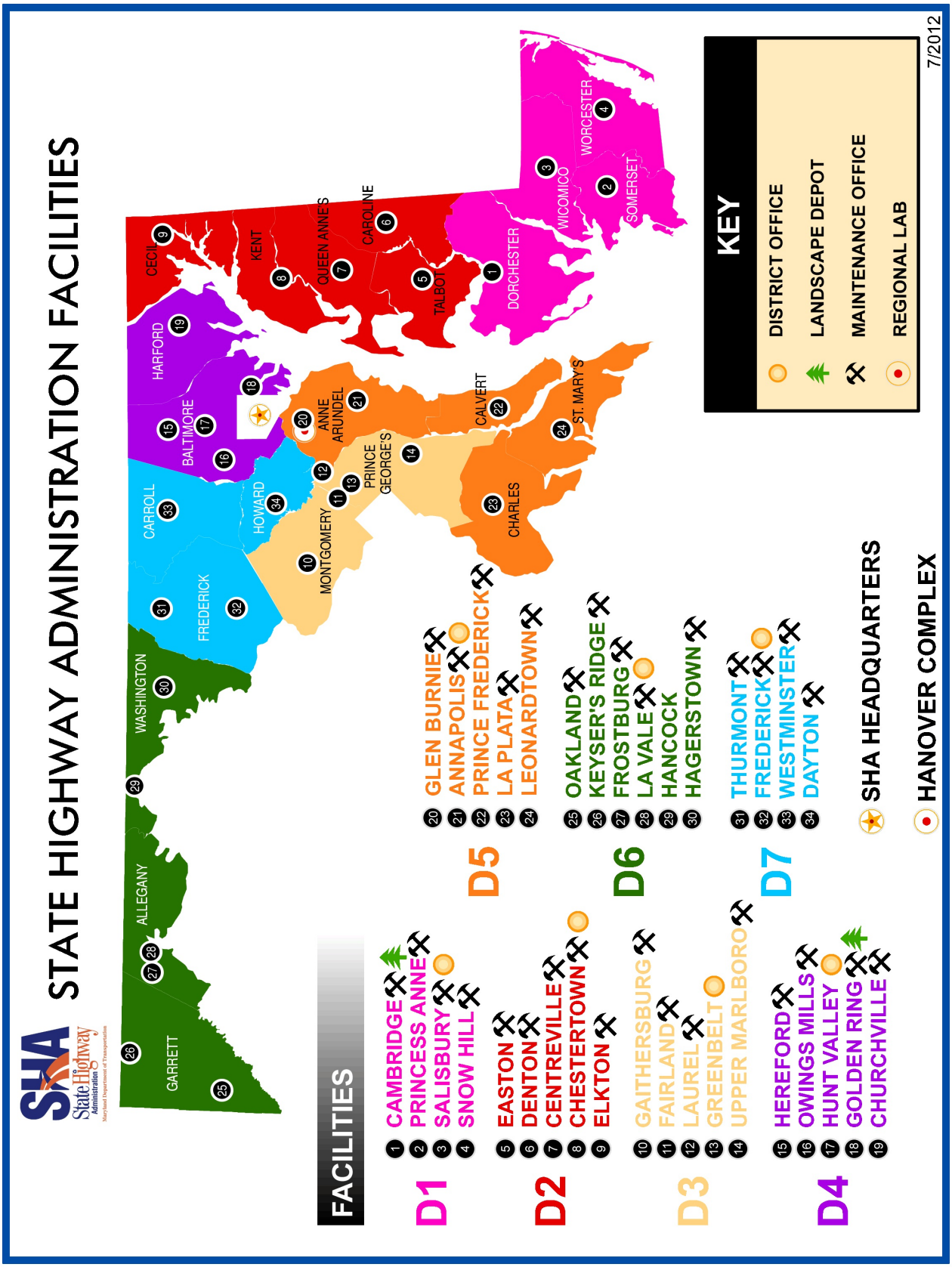
D) Pavement Edge Drop-offs of Greater Than 2 ½ inches But Equal to or Less Than 5 inches

1. Pavement edge drop-offs greater than 2 ½ inches shall be in compliance with Book of Standards for Highway & Incidental Structures, Standard No. MD 104.06-17.
2. Adjacent pavement elevation differences, drop-offs exceeding 2 ½ inches shall be paved to match with the abutting lanes or shoulders on the same working day in accordance with Standard Specifications For Construction And Materials Section 504.03.08 - Edge Drop-off. As a result of this, the complete pavement section including shoulders shall be at the same elevation at the end of each working day.
3. Drop-offs between lane and shoulder or shoulder and earth grading, exceeding 2½ inches, but equal to or less than 5 inches shall be provided with an abutting wedge with a slope of 4:1 or flatter at all times while no work is being performed. See Book of Standards for Highway & Incidental Structures, Standard No. MD 104.01-28 for wedge detail.
4. Temporary transverse tie-in transitions during the paving operation shall be in accordance with Standard Specifications For Construction And Materials Section 504.03.09 - Tie-In. The transverse tie-in shall be completed prior to traffic being allowed on the pavement.

E) Pavement Edge Drop-offs Greater Than 5 Inches

1. Pavement edge drop-offs exceeding 5 inches which are next to or within 12 feet of a lane of traffic shall be provided with a temporary concrete barrier or other suitable barrier as approved by the MDOT SHA, to preclude crossing the drop-off throughout its entire length.
   a) Pavement edge drop-offs exceeding 5 inches which are next to or within 12 feet of a lane of traffic shall be in compliance with Book of Standards for Highway & Incidental Structures, Standard No. MD 104.06-18.
2. Pavement edge drop-offs exceeding 5 inches which are greater than 12 feet away from traffic (and not protected with an approved barrier) shall be provided with an abutting wedge with a slope of 4:1 or flatter at all times while no work is being performed.
   a) Pavement drop-offs exceeding 5 inches which are greater than 12 feet away from traffic (and not protected with an approved barrier) shall be in compliance with Book of Standards for Highway & Incidental Structures, Standard No. MD 104.06-19.

APPENDIX


STATE HIGHWAY ADMINISTRATION FACILITIES
SHA
State Highway Administration
Maryland Department of Transportation
GARRETT
ALLEGANY
WASHINGTON
FREDERICK
CARROLL
HOWARD
MONTGOMERY
PRINCE GEORGE'S
ANNE ARUNDEL
BALTIMORE
HARFORD
CECIL
KENT
QUEEN ANNES
CAROLINE
TALBOT
CALVERT
CHARLES
ST. MARY'S
DORCHESTER
WICOMICO
WORCESTER
SOMERSET
KEY
DISTRICT OFFICE
LANDSCAPE DEPOT
MAINTENANCE OFFICE
REGIONAL LAB
7/2012
FACILITIES
D1
1 CAMBRIDGE
2 PRINCESS ANNE
3 SALISBURY
4 SNOW HILL
D2
5 EASTON
6 DENTON
7 CENTREVILLE
8 CHESTERTOWN
9 ELKTON
D3
10 GAITHERSBURG
11 FAIRLAND
12 LAUREL
13 GREENBELT
14 UPPER MARLBORO
D4
15 HEREFORD
16 OWINGS MILLS
17 HUNT VALLEY
18 GOLDEN RING
19 CHURCHVILLE
D5
20 GLEN BURNIE
21 ANNAPOLIS
22 PRINCE FREDERICK
23 LA PLATA
24 LEONARDTOWN
D6
25 OAKLAND
26 KEYSER'S RIDGE
27 FROSTBURG
28 LA VALE
29 HANCOCK
30 HAGERSTOWN
D7
31 THURMONT
32 FREDERICK
33 WESTMINSTER
34 DAYTON
SHA HEADQUARTERS
HANOVER COMPLEX

DISTRICT OFFICE CONTACT INFORMATION

MARYLAND STATE HIGHWAY ADMINISTRATION, DISTRICT #1
660 West Road
Salisbury, MD 21802
Phone: 410-677-4000 or 800-825-4742
FAX:410-543-6598

MARYLAND STATE HIGHWAY ADMINISTRATION, DISTRICT #2
615 Morgnec Road
Chestertown MD 21620
Phone: 410-778-3061 or 800-637-9740
FAX: 410-778-0851

MARYLAND STATE HIGHWAY ADMINISTRATION, DISTRICT #3
9300 Kenilworth Avenue
Greenbelt, MD 20770
Phone: 301-513-7300 or 800-749-0737
FAX: 301-513-7415

MARYLAND STATE HIGHWAY ADMINISTRATION, DISTRICT #4
320 West Warren Road
Hunt Valley MD 21030
Phone: 410-229-2300 or 1-866-998-0367
FAX: 410-527-4690

MARYLAND STATE HIGHWAY ADMINISTRATION, DISTRICT #5
138 Defense Highway
Annapolis, MD. 21401
Phone: 410-841-1000 or 410-841-5450 or 800-331-5603
FAX number: 410-841-5309

MARYLAND STATE HIGHWAY ADMINISTRATION, DISTRICT #6
1251 Vocke Road
LaVale, MD 21502
Phone: 301-729-8400 or 800-760-7138
Fax: 301-729-6968

MARYLAND STATE HIGHWAY ADMINISTRATION, DISTRICT #7
5111 Buckeystown Pike
Frederick, Maryland 21704
Phone: (301) 624-8100 or 800-635-5119
FAX: (301) 624-8225

UTILITY EMERGENCY INFORMATION CHECKLIST

Company Name: _____ Phone #: _____

Contact Person: _____ E-mail: _____

County: _____ Route Number: _____

Location: _____

Emergency Description: _____

_____

Are there any injured at the location? _____

Is there anything that might be hazardous to 1st responders at the location? (Energized down lines, Explosive gas, etc.)

_____

Provide details for any additions or exclusions on the back of this checklist.

Underground Services (Pipelines, Conduits, Power, Cables or Other Facilities)

What type of facility (Water/Sewer/Gas/Power/Cable): _____ What size is the facility (Inches): _____

When was the problem first noticed: _____ Is it a main or service line: _____

Type of material the facility is made of: _____ How deep is the facility (Feet): _____

Are any travel lanes going to be shut down: _____ If so how many: _____

Will the pavement be cut: If so how big of an opening (Area): _____

Pressure (PSI): _____ Does it involve a MDOT SHA Structure (Bridge, Wall or Sign Structure): _____

Above Ground Services (Poles, Hydrants, Cabinets or Other Facilities)

Reason for replacement (Wind Damage, Hit by Vehicle, other): _____

Description of facility: _____ Height of facility (Feet): _____

Will the facility be replaced at the same location: _____ If yes, consider an improvement to clear zone to prevent future damages to facility.

Will the facility be replaced closer to the roadway: _____ If so, distance from E.O.P. (Feet): _____

Are any travel lanes going to be shut down: _____ If so how many: _____

Will any transfers be needed by other attachees: _____ If so, who: _____

_____

UTILITY TABULATION FORMS

State Highway Administration
Office of Real Estate
Public Utility Section

Page 1

State Highway Administration
PO Box 717
Baltimore, Maryland 21203

Date: 1/12/2018

UTILITY TABULATION FORM

Name of Utility: _____ **Address:** _____

Contract No.: _____ **File Number:** _____

Description: _____

Aerial Facility	Utility Description	Distance L-- Left R-- Right	Station	Date of Grant to Utility	Utility Title Acquired From	Title Reference	Location			SHA Respon-sibility	Remarks
							in	on	out		

FOR USE OF SHA OFFICE OF REAL ESTATE (PUBLIC UTILITY ADJUSTMENT SECTION) ONLY

All measurements taken from base line of construction of

Utility: Date:

SHA: Date:

Aerial RW-57 Form

State Highway Administration
Office of Real Estate
Public Utility Section

Page 1

State Highway Administration
PO Box 717
Baltimore, Maryland 21203

Date: 3/2/ /2020

UTILITY TABULATION FORM

Name of Utility: Verizon of Maryland Inc. **Address:** 425 Blackiston Avenue Cumberland, MD 21502

Contract No.: GA1955180 **File Number:**

Description: US 219 Replacement of Small Structure No. 11010XO Tributary of Youghiogheny River

Under-ground Linear Footage	Utility Description	Distance L-- Left R-- Right	Station	Date of Grant to Utility	Utility Title Acquired From	Title Reference	Location in	Location on	Location out	SHA Respon-sibility	Remarks
##	Verizon Fiber	22.5' LT	10+09	1969							
		24.0' LT	11+85								

↳ FOR USE OF SHA OFFICE OF REAL ESTATE (PUBLIC UTILITY ADJUSTMENT SECTION) ONLY

All measurements taken from base line of construction of

Utility: Date:

SHA: Date:

Underground RW-57 Form

Funding Categories & Utility Coordination

Major Projects Funding Categories:

Fund	Title	Description	Utility Coordination
70	Primary	New construction or major reconstruction on primary roads.	Generally moderate to major utility impacts.
71	Secondary	New construction or major reconstruction on non-primary roads.	Generally moderate to major utility impacts.
72	Interstate	New construction or major reconstruction on interstate system highways.	Generally minimal to moderate utility impacts unless at interchanges with primary or secondary roads.

System Preservation/Other Funding Categories:

Fund	Title	Description	Utility Coordination
23	Weigh Station	Building, paving, excavation, barrier installation, foundation, fencing, lighting, or landscaping work to create or retrofit weigh stations.	Generally minimal utility impacts.
24	Environmental Preservation	Landscaping, wildflower seeding, reforestation and rest areas.	Generally minimal utility impacts.
25	Transportation Enhancements	Includes urban greenways, rail-trail conversions, preservation of certain historic sites, landscaping and pedestrian/bicycle improvements.	Generally minimal to moderate utility impacts usually with pole relocations.
26	Sound Barriers	Retrofit sound barriers along existing highways, barrier rehabilitation and noise berms.	Generally minimal to moderate utility impacts usually with utility crossings.
27	Rest Area	Pavement expansion, lighting, landscaping, drainage, building construction, and/or excavation work for the creation or repair of rest areas.	Generally minimal to moderate utility impacts. Can include underground and aerial relocations.
29	Facilities & Equipment	Construction and repair of buildings, building or site improvements that can include salt barns, maintenance shops, offices, or other MDOT SHA structures.	Generally minimal to moderate utility impacts usually with utility services.
30	Crash Prevention	Includes roundabouts, minor geometric improvements, and general corridor improvements	Generally minimal to moderate utility impacts. Can include underground and aerial relocations.
33	ADA Retrofit	Sidewalks, crosswalks, ramp retrofit to address compliance and avoid sanctions.	Generally minimal to moderate utility impacts usually with pole relocations.

Funding Categories & Utility Coordination

74	Drainage	This fund consists of improvements to areas of recurring flood damage or road closures.	Generally minimal to moderate utility impacts.
76	Safety & Spot Improvements	Includes safety improvements at high accident locations, intersection capacity improvements, slide repairs, roundabouts, ramp modifications and R/R crossings.	Generally moderate to major utility impacts depending on location.
77	Resurfacing & Rehabilitation	Resurfacing, including concrete patching, joint sealing and pavement markings.	Generally minimal utility impacts usually with surface structures. Should coordinate with Utilities if facilities need replacement before paving.
79	Sidewalks	Includes the construction of retrofit sidewalks along state highways and the reconstruction/replacement of existing sidewalks if part of a revitalization effort in an officially designated urban revitalization area.	Generally minimal utility impacts usually with pole relocations or surface structures.
80	Bridge Replacement & Rehabilitation	Includes bridge replacements, deck replacements, major rehabilitations, deck overlays, parapet modifications, bridge repainting/spot painting and all structure condition inspections.	Usually no utility impacts for painting, overlays, or parapet type of projects. Rehabilitation or replacement projects will have moderate to major utility impacts.
82	TMDL Compliance	Plan, design, and construct stormwater controls and alternative water quality improvement strategies in Maryland Phase I and Phase II Counties in order to meet the US EPA's Chesapeake Bay TMDL requirements by the year 2020.	Generally, no utility impacts unless with underground utilities.
83	Urban Street Reconstruction	Rehabilitation through urban areas including pavement and drainage reconstruction. Projects may include local participation for sidewalks, street furniture, landscaping and other urban amenities.	Major aerial and underground utility impacts. Significant coordination required.

Funding Categories & Utility Coordination

84	Community Safety & Enhancements	This fund consists of improvements where the emphasis is on enhancing the existing infrastructure to promote economic revitalization such as resurfacing, reconstructing drainage, curb and gutter, landscaping, signing, parking bays and lighting.	Major aerial and underground utility impacts. Significant coordination required.